A STUDY OF THE HONG KONG WATCH AND CLOCK INDUSTRIES

by

FOK OI-LING, CATHERINE
霍靄玲

CHEUNG TUNG-LAN, TONY
張東林

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Mr. Lamp Li
Advisor

ABSTRACT

The importance of the Hong Kong watch and clock industries is demonstrated by their sustained export business which ranked the largest in the world in quantity terms and the fourth in the domestic exports of Hong Kong for a number of years.

This research attempts to study the history and development of the Hong Kong watch and clock industries, to appraise their performance based on collected statistics, to analyse their strengths, weaknesses, threats and opportunities, to evaluate the present government policy on these particular industries and finally, to make recommendations to solve some of the problems which the industries encounter.

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CHAPTER I

INTRODUCTION

Until the last century, watches were produced mostly by hand. Although mechanisation has emerged gradually since the beginning of the century, watch and clock manufacture continues to remain a labour intensive task, relying heavily on the skills of experienced workers.

The industrial environment of Hong Kong which is particularly suited to small and light consumer goods industries has nurtured the rapid growth of the watch and clock industries in Hong Kong besides other successful labour-intensive industries. During the last two decades, growing demand for Hong Kong made watches and cases, watch dials and other accessories by overseas manufacturers of complete watches led to rapid expansion of the industry. The changes in technology have helped Hong Kong develop herself in different phases into one of the major watch and clock manufacturing centres of the world.

In a short history of just over 30 years, Hong Kong has strived to become the largest exporter of watches in the world in quantity terms. In 1985, domestic export of watches and clocks amounted to HK$9,088M, representing 7% of Hong Kong's total domestic exports. In 1986, the watch and clock industries had demonstrated an impressive growth of 25%, the highest rate of growth among all major industries, to HK$11,323M, slightly

behind toys (HK$11,607M), making it the fourth largest exporting industry of Hong Kong only after textile/clothing, electronics and toys.

The watch and clock industries are basically assembly-oriented. Parts and components are largely imported from Japan, Switzerland, China and Taiwan. Notwithstanding this, success of the watch and clock industries is built on their versatility in satisfying the requirements of overseas buyers.

The researchers believe this paper is the first in-depth study of the Hong Kong watch and clock industries as reports on these particular industries so far published were largely brief market reports issued by the government, quasi-government institutions or trade promotion bodies.[1]

The objectives of this research study are :

1) To study the history of Hong Kong watches and clocks industries.

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1 Examples are the brief reports :

Industrial Hong Kong : Clocks & Watches. The Indian Chamber of Commerce Hong Kong, 1971.

Industrial Profile : Hong Kong's Watches and Clocks Industry. Industrial Data Branch, Hong Kong Gevernment Industry Department, Oct 1985.

Hong Kong's Watches and Clocks Industry. Hong Kong Trade Development Council, Aug 1986.

2) To analyse the collected statistics on Hong Kong domestic exports, watches and clocks exports, Hong Kong industrial gross output and watches and clocks output over the last ten years.

3) To appraise the performance and to review the economic role of the Hong Kong watches and clocks industries.

4) To analyse the strengths, weaknesses, threats and opportunities of the Hong Kong watch and clock industries.

5) To evaluate the present Government policy

6) To identify the difficulties which Hong Kong watch and clocks manufacturers/exporters are confronted with and to recommend policies on how the Government could help the healthy growth and development to the watch and clock industries.

CHAPTER II

PURPOSE OF STUDY AND METHODOLOGY

Purpose and Scope of Study

Purpose of this research is to study and analyse the history of development and performance of the Hong Kong watch and clock industries in the last 10 years from 1977 to 1986, to identify the strengths, weaknesses, threats and opportunities of the industry and to attempt to recommend policies on how the Government could assist the industries to maintain its significant role in contributing to the economy.

Analysis based on collected data are taken in the areas of export performance, gross output, number of establishment and size of employment in order to support the study.

Methodology

The research results are based mainly on findings obtained from desk research and interviews with Hong Kong watches and clocks manufacturers.

The research involves grouping, organising and arranging available data into charts, tables and figures for analysis and comparison. Statistical data are collected from the following sources :

1) Hong Kong Review of Overseas Trade (1976 - 1985) which contains statistics of Hong Kong's domestic exports of major manufactured products by major export markets and principal commodities.

2) Hong Kong Trade Statistics (monthly) which provides all detailed data of Hong Kong's domestic exports, re-exports and imports.

3) Annual Digest of Statistics (1978 and 1986) which extracts all important statistics on different aspects of the economy. For certain items, statistics on the last ten years are listed out for comparison.

4) Survey of Industrial Production (1979-84) that gives data on gross output, number of establishments, number of employments and sizes of manufacturing operations for the analysis.

The above trade and industrial publications are obtained from the Government Publications Office, University Library and the library of Hong Kong Trade Development Council.

Interview

As there are practically no current literature for revealing the success story of the Hong Kong watch and clock industries, the researchers have to resort to interviews in order to obtain the necessary information for writing on the part of history.

Manufacturers are interviewed in order to understand the part they played in the development of the Hong Kong watch and clock industries and to analyse their reaction to the current problems and difficulties they are facing. A total of 22 maunfacturers were selected for interview based on their product representativeness and size of establishment. Appendix I lists the companies being approached. Out of these, 16 were watch manufacturers, seven were clock manufacturers and ten were engaged in watch and clock parts and components.[2] However, some companies had declined for an interview for various reasons and those companies/organisations finally interviewed are listed at the end of the Bibliography. Many of those interviewed are office-bearers of the Hong Kong Watch Manufacturers Association or the Hong Kong Watch Trades and Industries Association. Some are also members of the Hong Kong Government Trade Advisory Committee and the Watch and Clock Advisory Committee of the Hong Kong Trade Development Council.

Other than watch and clock manufacturers, two economists of the Hong Kong Trade Development Council, the Managing Director of Hong Kong Standard and Testing Centre and the Editor of "Watches, Clocks & Jewellery", Hong Kong Daily News, were also interviewed to solicit their views on different aspects of the Hong Kong watch and clock industries.

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2 There are overlappings as 7 manufacturers are engaged in both watches and clocks and 3 in both watches and watch parts.

Grouping and Organising Data

Statistics collected from the above sources are grouped and organised both by manual work and by the help of personal computer. Raw data are extracted and organised for analysis and comparisons.

The domestic exports are re-grouped by major products under the following six categories :

1) Textile and clothing accessories
2) Electronics
3) Toys, dolls and games
4) watches and Clocks
5) Electrical household equipment

It should be noted that some items in electronics are also classified under products listed elsewhere namely, watches and clocks; toys and games, etc. However this overlapping does not affect the overall comparison.

With regard to the "statistics of major products sold" being analysed in the section of Gross Output , it should be noted that they are not directly comparable with the domestic export figures published in the Hong Kong Trade Statistics, although such comparison can be informative. In doing so, a few points should be noted. First, although the watch and clock manufacturing sectors are on the whole export-oriented, a substantial amount of products are sold to local consumers or establishments. Second, trade statistics are classified according to the United Nations

Standard International Trade Classification (SITC) and this classification is not matchable item-by-item with the ISIC classification of commodity items. Third, external trade statistics are compiled on a monthly basis from trade declarations relating to individual shipments where the product data of this particular survey were obtained from establishments whose returns are mostly based on accounting records covering a year's manufacturing activity with numerous product transactions. Fourth, the basis of valuation may differ in the two sets of data when there are intermediaries (e.g. importers and exporters) involved, so that the prices of goods are marked up by a resale margin. Stockpiling by intermediaries may also lead to timing differences in the data.[3]

Definition of terms

Manufacture

Any process of work that employs factors of production and transform the shape and substance of the input material

Exports

Export of goods domestically manufactured. The term used throughout this report always means domestic export. Only those goods eligible for the Hong Kong Certificate of Origin are counted.

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3 Survey of Industrial Production 1984

Gross Output

The gross output is the total of sales, work done and changes in stocks of work in progress and finished products.

Census Value Added

Being the Gross Output less consumption of materials, supplies and industrial services.

Establishment

An establishment used in this report is referred to a manufacturing unit which engages under a single ownership or control, in predominantly manufacturing of goods at a single physical location.

Number of Persons Engaged

The number of persons engaged being used in this report counts on all people who are attached to the manufacture unit, including all full and part time operative and non-operative employees, working proprietors and active business partners and even unpaid workers.

CHAPTER III

DEVELOPMENT OF THE HONG KONG WATCH AND CLOCK INDUSTRIES IN THE INTERNATIONAL SCENE

The Early Days

Although the earliest time-keeping instruments were invented in China, the first all-mechanical clocks known were made at around 1300 A.D. in Europe and the first portable timepiece to be carried on the person was constructed in 1504 A.D. in Germany.

Throughout much of the 16th Century, the small amount of watchmaking that took place was most heavily concentrated in Germany, England and France. Not long after that, Geneve built up its watch-making industry as many refugee goldsmiths and metalworkers migrated from other European countries to Switzerland. Although most of the watchmaking activities were organised in cottage form, Geneva became the centre of watch manufacturing since the 16th Century and was able to produce 5,000 watches, all by hand.

In the 50 years after being colonialised, Hong Kong was still a primitive fishing port. At this time, the Swiss watchmakers, though still operating from their cottages, had already started organising themselves producing watches on assembly-line basis.

The United States entered the watch manufacturing scene in as early as the 19th Century. During the peak time in the second half of 19th Century, there were 44 watch factories in various

places of the U.S. However, only two survived the economic cycles of the 19th and 20th centuries to remain watch manufacturers at the beginning of the 1960's. Many had either gone bankrupt or turned into watch importers.

Other countries with growing industrial complexes after the World War II began making their influence felt on the world watch market in the late 1950's.

Russia, producing millions of watches annually, began exporting grades of well-engineered watches about 1948. Japan capitalised many new factories after World War II and had built a healthy world export market with low-cost, high quality watches having the finest metals and craftsmanship.

In contrast to countries like Switzerland and Japan which have long and well-established watch and clock industries, Hong Kong is a late starter in the 1950's when "Roskopf"[4] or lever mechanical watches (from imported movements) and parts like watch cases, bands and dials were produced. In these days, Hong Kong was little known in the international market.

The Period of Rapid Development : 1964-1974

The international watch industry was predominated by the Swiss before 1964, with their market threshold spreading all over

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4 This is the first cheap but good watch named after an eminent watchmaker Georges Frederic Roskopf (1813-1889) who was a German naturalised Swiss. Watchmakers and Clockmakers of the World (Vol. 1)

the world. There were over ten offices of the Information and Technical Centre of the Swiss Watch Industry in the world's major cities. Purposes of these centres were to provide support to the technical services of the Swiss watches sold and to promote the sales of Swiss watches in important overseas markets. At that time, the Japanese watch products were still little known in the international market.

Realising that Hong Kong was a potential consumer market for Swiss watch products, the Swiss watch industry decided to establish an information and technical centre in Hong Kong in 1965.

1964 to 1974 was a period of rapid development. Establishment of the Swiss Centre had helped Hong Kong bring up a group of young watchmakers and facilitated the coordination of watch trade between Hong Kong and Switzerland. In 1966, a big Swiss Roskopf movement manufacturer came to Hong Kong and carried out a market research and a study on the industrial infrastructure. They were impressed by the favourable investment environment and finally decided to set up an office to promote movement assembling in Hong Kong. This was an important step which paved the way for Hong Kong's penetration to the world's low-end watch market. The rapid development of the watch assembling activities had further convinced many Swiss companies to establish themselves in Hong Kong in promoting their precision machineries, sophisticated equipment, tools and parts. This had laid the foundation for the Hong Kong watch industry to move up-market later.

During this period, Japan was eager to look for outlets for her own products which were aimed at the medium-end branded market. After aggressively promoting their quality but cheap products, the Japanese manufacturers successfully dominated the medium-end market and caught the Swiss manufacturers by surprise. This new development had a long lasting effect on the Hong Kong watch and clock industries.

The Swiss manufacturers quickly reacted to this situation and changed their strategies. Taking advantages of cheap labour cost and mature basic technical skill, they began to pour into Hong Kong to set up their own factories to assemble watches. Many of the watchmakers who learned their skills from the Swiss Centre were recruited to manage these factories and among them, those having enterpreneurial flair even started their own business after gaining the marketing and manufacturing experience during their previous employment in the watch industry.

The Japanese followed suit several years later. They established their factories and exported a colossal sum of watches and clocks which were manufactured under Japanese technology from Hong Kong. The Japanese also further eaten into the share of the Swiss watch markets and at the end of this period, the leading position of Swiss watch manufacturers had been greatly eroded.

Export of Hong Kong watch and clock products soared impressively during this stage of rapid development as shown in Table 3.1. In the clock sector, production of clocks was

concentrated in electric alarms and travel alarms as well as mechanical clocks in the 1960's and early 1970's.

Table 3.1

DOMESTIC EXPORTS OF WATCHES AND CLOCKS
1968 - 1974 IN VALUE TERMS (HK$M)

Year	68	69	70	71	72	73	74
Domestic Exports	69	108	135	175	202	293	510
Growth Rate over the Last Year (%)	+58	+57	+25	+30	+15	+45	+74

The Electronics Era since 1975

In the 1970's, owing to the postponement of the US space Development Project, many advanced electronic technologies turned to applications in the civil sector. The emergence of digital technologiy in 1974 revolutionised the watch and clock industries. Hong Kong quickly took hold of this opportunity and in less than 12 months' time, Hong Kong was able to turn up the first Light Emmitting Diodes (LED) watches. Incidentally, many overseas graduates who specialised in electrical and electronic engineering working in the local electronics firms found themselves facing a golden opportunity. Under the active promotion of several large U.S. component corporations, LED components quickly fell into the hands of this group of people who then inaugurated the period of Hong Kong electronic watches.

The then novel Light Emmitting Diodes (LED) display resulted

in a temporary boom, but the high power consumption and the inconvenience of being in the normally off mode lead to the virtual demise of this design. One year after the LED watch appeared, Japanese manufacturers began marketing digital watches with a long-life Liquid Crystal Display (LCD).

Again, Hong Kong was quick to switch to this much improved display technology. As the manufacturing and export of LCD watches flourished , the Japanese electronic component factories flooded the Hong Kong market with extremely competitive component parts and driven the US component suppliers out of scene. At the end, Hong Kong benefitted from this as costs and prices of electronic watches dropped tremendously, leading to soaring exports year by year as shown in Table 3.2.

Table 3.2

DOMESTIC EXPORTS OF WATCHES & CLOCKS
1975-1986 IN VALUE TERMS (HK$M)

YEAR	75	76	77	78	79	80
DOMESTIC EXPORTS	644	1208	1694	2734	4354	6288
GROWTH RATE OVER THE LAST YEAR (%)	+26	+87	+40	+61	+59	+44

YEAR	81	82	83	84	85	86
DOMESTIC EXPORTS	7104	7168	8259	8875	9088	11323
GROWTH RATE OVER THE LAST YEAR (%)	+13	+1	+15	+7	+2	+25

The most impressive growth rate was recorded in 1976 when domestic export of watches and clocks reached HK$1,208M, representing 87% rate of growth over 1975. This demonstrated the strong worldwide demand for digital watches which Hong Kong started to produce and export.

The technology has advanced further in creating the analogue quartz-crystal watches which are far more accurate than the mechanical watches of similar look. Even the cheapest mass-market models offer an accuracy within one second per day while high precision models with accuracy within a few seconds per year have also appeared.

Technologically, the great advances in watch engineering in the 20th Century were made in the development of electric and electronic watches. Capitalising these new technologies, Hong Kong quickly turned herself into the world's largest exporter of watches in quantity terms since 1978 as depicted in Table 3.3. In 1980, Hong Kong overtook Japan as the world's second largest exporter of watches by value as shown in Table 3.4. Although this position was regained by Japan in 1981, Hong Kong maintained its position as the largest exporter by quantity achieved since 1978.

The rapid development in the electronics industry, and the emergence , in the seventies, of digital watches indeed marked the beginning of a new era in the industry. Many local manufacturers quickly went into or diversified into the production of electronic watches and clocks.

The development of the electronics industry also stimulated

Table 3.3

A COMPARISON OF HONG KONG WITH OTHER COUNTRIES AS AN EXPORTER OF WATCHES IN QUANTITY ('000 PIECES) (1979 - 1985)

	79	80	81	82	83	84	85
Switzerland	30,266	28,448	25,335	18,486	15,614	60,521	25,061
Japan	25,242	36,213	43,455	42,253	49,108	57,024	64,967
Hong Kong	73,390	119,064	146,338	204,358	270,212	306,807	325,156
Korea	4,830	n.a.	11,248	12,142	25,409	19,177	20,112
France	8,655	8,052	6,519	6,357	5,444	4,869	n.a.
F.R. Germany	3,309	2,982	3,538	3,511	3,797	4,025	3,778

Table 3.4

A COMPARISON OF HONG KONG WITH OTHER COUNTRIES AS AN EXPORTER OF WATCHES IN VALUE TERMS (HK$M) (1979 - 1985)

	79	80	81	82	83	84	85
Switzerland	7,237	7,430	8,353	8,235	9,266	11,728	11,015
Japan	4,031	5,152	6,410	5,029	6,612	8,167	7,944
Hong Kong	3,516	5,204	5,709	5,529	6,297	6,632	6,616
Korea	390	n.a.	886	609	784	963	920
France	672	691	643	602	710	741	n.a.
F.R. Germany	482	454	483	483	592	733	813

the manufacture of electronic clocks, which currently constitute a significant portion of Hong Kong's domestic exports of complete clocks. Since 1982, Hong Kong is the largest exporter of clocks in the world, ahead of Japan and F. R. Germany in quantity terms. (Table 3.5) In value terms, Hong Kong is the third largest only after Japan and F.R. Germany as shown in Table 3.6.

Factors Attributable to the Growth of the Hong Kong Watch and Clock Industries

Growth of the Hong Kong watch and clock industries could be attributed to the following factors:

Import of Skills and Technology

The opening of Swiss Information and Technical Centres of the Swiss Watch Industry in 1966 had trained up a group of skilled watchmakers. It was these knowledgeable local watchmakers who helped turn Hong Kong into a large watch and clock manufacturing centre.

Innovation in the Development of Electronic Watches and Clocks

Based on advances in miniaturisation of electronic components and batteries, watches and clocks manufacturers found themselves more versatile in the design of their products. Mass production of integrated circuits (IC) also helped greatly reduce the prices of watches which led to greater demand on the side of consumers.

Table 3.5

A COMPARISON OF HONG KONG WITH OTHER COUNTRIES AS AN EXPORTER OF CLOCKS IN QUANTITY ('000 PIECES) (1979 - 1985)

	79	80	81	82	83	84	85
Japan	8,926	14,486	16,909	15,089	17,368	19,047	20,153
F.R. Germany	16,150	15,665	15,496	15,300	14,978	17,689	20,818
Hong Kong	8,542	10,113	15,524	35,288	39,894	48,054	51,882
Taiwan	4,770	5,435	6,854	9,767	13,906	17,663	18,736
Korea	2,407	n.a.	1,844	861	1,690	2,841	2,432
Switzerland	371	340	451	374	1,606	1,987	1,944

Table 3.6

A COMPARISON OF HONG KONG WITH OTHER COUNTRIES AS AN EXPORTER OF CLOCKS IN VALUE TERMS (HK$M) (1979 - 1985)

	79	80	81	82	83	84	85
Japan	416	719	1,046	849	1,137	1,274	1,240
F.R. Germany	839	857	834	827	934	1,034	1,137
Hong kong	269	346	482	776	892	953	781
Taiwan	102	121	199	208	282	363	433
Korea	144	n.a.	145	102	143	184	155
Switzerland	105	124	135	153	165	167	186

Increasing Worldwide Demand on Watches and Clocks

In the old days, possessing a watch was a status symbol. However the attitude of consumers towards watches has changed tremendously as society becomes more affluent. Watches are affordable in these days and they are no longer only a time keeping instrument but have become part of fashion. Like fashion accessories, one might have several or over a dozen of watches for different occasions and for matching with fashion clothings. The innovation of digital technology has certainly helped boost this worldwide trend.

Low Capital Investment

Start-up capital required for setting up a watch or clock assembly plant is very small as it is basically a labour-intensive job requiring few machineries. In a simple set-up, a bonding machine and quality control precision instrument could form a production line sufficient for the assemble of several hundred watches a day.

Small Factory Space Required

Hong Kong faces a problem of acute scarcity of land and is therefore especially suited for the manufacture of light consumer products. The small size of watches, clocks and their accessories is ideal for work in this tiny but compact territory.

Simple Skills for Assembly of Electronic Watches

Technology involved in assembing electronic watches is simple as the movements are in modular forms and the major

electronic components are readily available from overseas suppliers. Almost anyone with minimum training can assemble electronic watches and clocks.

Abundant and Flexible Supply of Skilled Labour

Hong Kong has an abundant and relatively cheap supply of young female workers with keen eyesight and nimble fingers who are ideal for the manufacture of watches and clocks. Supply is flexible as school leavers or workers from other industries can easily be trained to become skilled labour in a short period of time.

Well-established Ancillary Industries

Hong Kong has well-established supporting industries for producing great varieties of watch cases, bands and dials, although the sophisticated movements and parts are not produced locally. In fact, these supporting industries manufacturers are those forerunners of the Hong Kong watches and clocks industry in the early days.

CHAPTER IV

PRODUCTION TECHNIQUE

While many of the production processes have been fully automated by use of robots in Japan, Hong Kong is still lagging behind at the manual stage, assisted by limited automatic machines only. This is because the watch and clock industries are assembly-oriented.

Production of watches and clocks can be grouped under four categories: 1) The assembly of modules 2) the assembly of mechanical movements 3) the production of cases and 4) the final assembly of complete watches and clocks.

Assembly of Modules

Modules of digital watches and clocks are made up of four basic components :

1) Liquid crystal Display (LCD) which includes a reflector and a corrector

2) An Integrated Circuit (IC) which is a Complementary Metal Oxide Semiconductor (C-MOS)

3) Quartz crystal

4) Printed Circuit Board (PCB)

Equipment required in the assembly operation include bonding machines, soldering guns, multitesters (volt-ohm-milliampere

meters) and timers for accuracy check.

Modules are mainly imported from overseas. Several large electronics manufacturers are also producing ICs locally. Although their quality is inferior to those imported ones, they nevertheless enhance the supply of electronic components to local module assemblers.

Hong Kong has also two local quartz crystal manufacturers in addition to the supplies from Japan, Taiwan and U.S. PCBs are mainly sourced locally as Hong Kong has a well established PCB industry.

The assembly of watch modules start with the cleaning of PCB's in an ultrasonic process. The cleaned PCB's are then ready for dice attachment, a process which C-MOS dice are placed onto PCB's. The next process is to connect the leading wires of the C-MOS chip to the PCB. This is done by bonding machines. As silicon chips are light sensitive, after bonding, both the chip and the bonding wires are sealed by black epoxy. PCB's are then baked in ovens to fasten the solidification of epoxy. The assembly process is completed when quartz crystals, displays, and connectors are connected to PCB's. Completed modules have to be tested for power leakage and accuracy; the former can be done by a multitester and the latter, by a timer. For quality control, manaufacturers may test run modules for a few hours.

Assembly of Mechanical Watch Movements

Hong Kong has only one clock and one watch manufacturer who

are vertically integrated in the production of clocks and watches. Their outputs are largely for in-house assembly and therefore Hong Kong can be said to be almost totally dependent on the supply of mechanical watch and clock movements from overseas.

The mechanical parts for watches and clocks are basically either in rod form such as the various shafts, pins and pinions, or in plate form such as the various wheels and the main plates for mounting the wheels and pins. Various milling, drilling, stamping and automatic screw machines are used in the production of these parts.

Mechanical alarm clocks have an average of over 60 parts. The assembly of mechanical clock and watch movements basically involves the setting of various wheels and pins on the plates of movements and finally fixing by screws.

The balance wheel with hair spring is the most delicate part of a mechanical clock or watch. The accuracy of a watch or clock depends, among other things, on the regular movement of the balance wheel. Before hair spring is attached to the wheel, the wheel has to be tested whether the weight of the wheel is in equilibrium on its axle. Electronic clocks and watches replace the "balance complete" of ordinary mechanical clocks and watches with electronic components, which include a C-MOS, a quartz crystal, a coil to act as a motor, and a number of wheels and stems for moving the hour and minute hands.

Assembly of Quartz Analogue Watch Movements

The assembly of quartz analogue watch movements resembles that of mechanical movements except that the former uses a crystal resonator giving a consistant frequency to drive the mechanical wheels through a stepping motor, supported by battery and controlled by C-MOS; while the latter uses a balance wheel with hair spring to keep regular turns to achieve accuarcy. Appendix II and III are the anatomy diagrams of mechanical and quartz analogue watch movements.

While assembling a digital watch requires an average of 60 bondings which are done mostly by bonding machines assembling, an electronic analogue watch requires an average of only 6 bondings. However, an electronic analogue watch involves an average of over 25 mechanical parts, the assembly of which requires more skilled labour.

Production of Cases

Machinery used in the production of watch cases include milling machines, turning machines (lathes), face-cutting machines, drilling machines, and polishing machines. Stainless-steel and brass are the major materials for cases. Although zinc-alloy is becoming popular, manufacturers are reluctant to produce zinc-alloy cases because they are priced too low to be profitable except in mass production.

To produce stainless steel cases, stainless-steel sheets

are cut into pieces about the size of a watch. A series of cutting and turning processes will turn the pieces into watch cases. Stainless-steel cases may not require plating. However, in order to ensure durability, the manufacture of stainless-steel cases is more time-consuming and involves more expensive machinery and equipment.

The production of brass cases begins with cutting brass rods into pieces about the size of watches. Then, these pieces will be heated and pressed into blanks or lugs roughly resembling the shape of the final product. Gold-plating and platinum-nickel-plating are the most popular finishes for brass cases.

Watch case production involves many labour-intensive process. The price of finished products depends on the material used as well as the number of cuttings required. The price of a stainless steel case usually doubles that of a brass case.

Compared with watch cases, casings for clocks are made of a large variety of materials: plastic, wood, metal, and even semi-precious stones.

ABS plastic is the mostly commonly used material for clock casings. As wood cabinets are more susceptible to climatic changes,they have to be dried and treated just as it is in the furniture industry. Supply of wood cabinets is mainly from the East Asian countries.

Assembly of Complete Watches

Apart from modules/movements and cases, the assembly of watches requires other parts such as the housing unit for fitting a module into a case, the watch glass, gaskets, bands, spring bars, and so forth. Mineral glass is usually used for mechanical watches. There are local as well as overseas supplies from Japan and Taiwan. Plastic (acrylic) lens, cut from large acrylic sheets, are used for digital watches for easy silk-screening on their surfaces. Gaskets are usually supplied by Swiss or Japanese suppliers. ABS housings are from plastic subcontractors or produced in-house.

In the assembly operations, workers usually work with motorized screw drivers, pincers, magnifying glasses, and soldering guns. Workers in Hong Kong are usually better watch assembly workers than those in Europe because the former usually have smaller stature and nimble fingers.

CHAPTER V

PERFORMANCE EVALUATION

The performance of the watch and clock industries has been brilliant. The industries have been growing, maturing quickly for the past 20 years. In the 1960's, there were very few manufacturers which only manufactured watch cases,, dials and some spare parts. Then the assembly of mechanical watches began by manufacturers importing watch and clock movements from overseas. In 1974, Hong Kong produced its first LED electronic watch. In 1976 and 1977, LCD watches began to gain popularity. The adaptability of Hong Kong manufacturers has allowed them to pick up the technique of electronic watch production easily and began mass production. In 1978, Hong Kong watch and clock industries entered a new era, it topped the exports of watches and clocks by quantity terms. Brought about by advanced digital technology, the LED and LCD watches were new innovations well received by the world market. Growth of domestic exports from 1976 to 1980 was more than 40% each year. In 1978, it registered a remarkable 61% increase over the previous year.

From 1980 to 1985, it was a period of consolidation tested by some bad years in domestic exports. The growth of watches and clocks in domestic exports dropped to below 10% in 1981, 1983 and 1984. The reasons were due to the economic recession worldwide, coupled with over-production, low profit margin, and that LCD watches began to lose its popularity. Hong Kong began to produce more of quartz analogue watches which are of a higher quality and

higher unit price. As shown in Table 5.1, the trend was quartz analogue watches began to gain heavier weights in the share of domestic exports. In 1986, it accounted for 61% of total value of domestic export for watches.

Table 5.1

EXPORT OF COMPLETE WATCHES
BREAKDOWN BY CATEGORY (1981 - 1986)
(SHARE IN PERCENTAGE OF TOTAL)

	1981	1982	1983	1984	1985	1986
Digital watches	53	53	50	40	32	28
Quartz analogue watches	16	20	31	44	56	61
Mechanical watches	31	24	19	16	12	11
Total	100	100	100	100	100	100

The watch and clock industries ranked fourth in 1986 after textile/clothings, electronics and toys industries. For many years, the watch and clock industries maintained this ranking though improvement was shown in the narrowing of the percentage share of domestic exports as compared with toys. In 1980, it surpassed toys by a remarkable growth of 44% and ranked third in terms of export value. The growth after 1980 slowed down and gradually declined to remain at the fourth rank.

In terms of the export quantity, the watch and clock industries had outperformed the average domestic exports as shown in Table 5.2 next page.

Table 5.2

HONG KONG DOMESTIC EXPORTS OF WATCHES AND CLOCKS
QUANTUM INDEX

	1981	1982	1983	1984	1985
Watches and clocks	100	110	123	133	151
All domestic exports	100	97	111	131	124

Source : Census and Statistics Department, Hong Kong Government

Share and Growth in Domestic Exports

In the last decade, domestic exports played a very important part in leading the growth of the Hong Kong economy. Several major industries dominated the domestic exports. Watch and clock industries are among the few that have brilliant performance.

As clearly shown by Table 5.3, total share of domestic exports for watches and clocks grew from a mere 1.1% in 1970 to a record high of 9.2% in 1980 only to drop to 7.4% in 1986. In 1970, its 1.1% compared pathetically with the 8.9% of toys. In 1977, the difference began to narrow when watches and clocks grew by 40% to 4.8% share of domestic exports. During the period after 1977, watches and clocks recorded impressive growths while the growth of other industries showed either modest or negative growth. In 1980, its 9.2% share of total domestic exports outgrew 8.6% of toys. In 1986, toys (7.5%) marginally took over watches and clocks by 0.1%.

In actual terms, total watches and clocks exports increased from HK$135M in 1970 to $1,694M in 1977 representing a growth of 11.5-fold. In the ten years from 1977 to 1986, the growth was from HK$1,694M (4.8% share of total domestic exports) to HK$11,323M (7.6% share of total domestic exports) or an increase of 668% ! Though the share of domestic exports had slightly declined since 1980 in real terms, export value for watches and clocks has always been rising. From 1970 to 1986, the increase has been an astounding 66-fold.

HONG KONG'S DOMESTIC EXPORTS BY MAJOR PRODUCTS

HK$ MILLION

(PERCENTAGE OF TOTAL DOMESTIC EXPORTS)

	1970	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Apparel & Clothing Accessories	4,337 (35.1%)	13,908 (39.7%)	15,709 (38.6%)	20,131 (36.0%)	23,258 (34.1%)	28,288 (35.2%)	28,824 (34.7%)	34,365 (32.9%)	46,714 (33.9%)	44,912 (34.6%)	52,162 (33.9%)
Textile Yarn & Fabrics	1,286 (10.4%)	2,696 (7.7%)	2,869 (7.0%)	4,065 (7.3%)	4,535 (6.7%)	5,302 (6.6%)	5,052 (6.1%)	7,084 (6.8%)	8,631 (6.3%)	7,823 (6.0%)	10,955 (7.1%)
Electronics(*)	1,173 (9.5%)	4,688 (13.4%)	6,446 (15.8%)	9,667 (17.3%)	12,855 (18.9%)	15,376 (19.1%)	15,986 (19.3%)	23,847 (22.8%)	31,098 (22.5%)	26,962 (20.8%)	33,366 (21.7%)
Toys, Dolls and Games	1,102 (8.9%)	3,042 (8.7%)	3,348 (8.2%)	5,156 (9.2%)	5,944 (8.7%)	7,313 (9.1%)	9,111 (11.0%)	8,845 (8.5%)	11,524 (8.4%)	10,010 (7.7%)	11,607 (7.5%)
Watches and Clocks	135 (1.1%)	1,694 (4.8%)	2,734 (6.7%)	4,354 (7.8%)	6,288 (9.2%)	7,104 (8.8%)	7,168 (8.6%)	8,259 (7.9%)	8,875 (6.4%)	9,088 (7.0%)	11,323 (7.4%)
Electrical Household Equipment	34 (0.3%)	611 (1.7%)	782 (1.9%)	1,202 (2.1%)	1,972 (2.9%)	2,997 (3.7%)	2,728 (3.3%)	3,673 (3.5%)	5,218 (3.8%)	4,551 (3.5%)	4,871 (3.2%)
	12,347	35,004	40,711	55,912	68,171	80,423	83,032	104,405	137,936	129,882	153,983

(*) Some items in "electronics" are classified under products listed elsewhere, namely, watches and clocks; toys and games, etc.

When comparing the share in total domestic exports, it is necessary also to compare the industry growth against the total domestic exports growth. Watches and clocks have had an impressive growth. As depicted by table 5.4, it out-performed the growth of total domestic exports from 1976 to 1980. After a slight consolidation from 1981 to 1983, it is the only industry that can sustain the economic slump in 1984/85 and showed a growth of 4% amidst a negative 6% drop in total domestic exports. All other major industries showed a negative growth rate. In 1985/86, the industry gained momentum again and once more out-performed the growth rate of total domestic exports by 6%.

From the above analysis, it is evident that the watch and clock industries had exhibited a significant growth and contributed substantially to the performance of the domestic exports which affect directly the growth of the economy.

Domestic Exports of Watches and Clocks by Type

Classification

Watches and clocks products can basically be classified under four main catagories, namely:

i) Complete watches which includes :

Electronic watches, digital (including LCD,LED)

Electronic watches, quartz-analogue

Electronic watches, digital-analogue

Mechanical watches

Table 5.4

COMPARISON OF EXPORT GROWTH RATES OF MAJOR PRODUCTS (1977 - 1986)

	77/76	78/77	79/78	80/79	81/80	82/81	83/82	84/83	85/84	86/85
Apparel & Clothing Accessories	- 3	+13	+28	+16	+22	+ 2	+19	+36	- 4	+16
Textile Yarn & Fabrics	-13	+ 6	+42	+12	+17	- 5	+40	+22	- 9	+40
Electronics	+15	+38	+50	+33	+20	+ 4	+40	+28	-13	+24
Toys, Dolls and Games	+28	+10	+54	+15	+23	+25	- 3	+30	-13	+19
Watches & Clocks	+40	+61	+59	+44	+13	+ 1	+15	+ 7	+ 4	+25
Electrical Household Equipment	+53	+28	+54	+64	+52	- 9	+35	+42	-13	+ 7
Total Domesitc Export	+ 7	+16	+37	+22	+18	+ 3	+26	+32	- 6	+19

ii) Complete clocks which includes

Clocks, electronic, complete

Clocks with watch movements

Clocks, electric, complete

Mechanical clocks, complete

iii) Watch Movements

Watch movements, electronic assembled

Other watch movements assembled

iv) Other parts and accessories

Watch cases and parts thereof

Watch parts, n.e.s. including LCD displays

Clock cases and parts thereof

Clock parts, n.e.s. including LCD displays

Time of play recording apparatus, etc.

Time switches with clock or watch movements

Watch bands, metal

Watch straps, other materials

Their share in total exports of watches and clocks as at 1986 are depicted in Table 5.5.

Table 5.5

VALUE AND PERCENTAGE SHARE OF DIFFERENT CATEGORIES OF WATCH AND CLOCK PRODUCTS IN TOTAL DOMESTIC EXPORTS IN 1986

Category	Percentage Share	Value (HK$M)
Complete watches	72.04%	8,135
Complete clocks	8.74%	987
Watch movements	3.76%	425
Other parts and accessories	15.45%	1,745

Complete Watches

Within the "complete watches" catagory, electronic watches out-weighed mechanical watches by quantity since 1979. In 1979 LCD watches jumped by 129% to HK$2,122M and replaced LED watches as the main line of electronic watches. The demand for LCD watches continued from 1980 to 1984 as manufacturers produced higher quality watches which were slimmer and have more features. Digital watches had been well accepted as promotional or gift items because of their attractive low prices. Major makers of digital watches designed new models with innovative features to stimulate consumers' interest in digital watches. As evidenced in Table 5.6, quartz analogue watches have overcome digital watches (LCD) by value in 1984. Quartz analogue watches amounted to HK$2,873M whereas for digital, the value dropped to HK$2,677M. However, in quantity terms, quartz analogue watches still far lagged behind digital watches. Since the introduction of "Swatch" by Switzerland, quartz analogue watches with colourful plastic casings and fancy dial designs had been very popular in 1985 and 1986 following the popular "Swatch" marketed by the Swiss. These plastic watches were relatively inexpensive and became a fashion accessory for the young people.

With the growing importance of electronic watches, mechanical watches lost its predominant position and since 1977 its export quantity has been declining from 34 million pieces to 22.2 million pieces in 1986.

The trend for quartz analogue watch in 1987 will continue

Table 5.6

DOMESTIC EXPORTS OF WATCHES AND CLOCKS BREAKDOWN BY CATEGORIES (IN VALUE HK$'000 AND IN QUANTITY '000)

	1981	1982	1983	1984	1985	1986
Electronic Watches						
Digital	2,914,644 (104,730)	2,914,248 (162,160)	3,172,227 (225,148)	2,677,068 (245,473)	2,112,323 (250,602)	2,271,427 (283,240)
Quartz Analogue	889,417 (8,381)	1,095,417 (12,991)	1,948,382 (21,773)	2,873,449 (32,837)	3,628,057 (52,688)	4,881,803 (66,892)
Mechanical Watches	1,904,500 (33,227)	1,519,120 (29,207)	1,176,402 (23,291)	1,081,694 (22,497)	780,577 (20,656)	888,254 (22,204)
Complete Clocks						
Electronic Clocks	405,095 (11,916)	530,394 (17,126)	623,662 (19,236)	597,922 (16,673)	391,036 (10,326)	529,489 (16,303)
Other clocks	76,581 (3,608)	245,678 (18,162)	268,421 (20,658)	355,253 (31,381)	389,970 (41,556)	457,272 (54,717)

Note :

SITC codes for electronic watches had been changed since 1981 therefore figures before 1981 are difficult to be drawn for direct comparison.

to be optimistic. Recent interviews shows that the manufacturers are concentrating on higher quality quartz analogue watch with higher profit margin over 30%. The larger manufacturers have already faded out from LCD watch manufacturing.

Clocks

The export value of electric clocks still showed an 87% increase in 1977. In 1978, electronic clocks took over to become the largest portion. In 1986, electronic clocks was still the mainstay in complete clocks category with an export value of HK$529M or 4.7% of total watches and clocks exports, followed closely by clocks with watch movements (classified under electronic clocks) which valued at HK$408M.

Parts and components

Parts and components made up to 15.45% of total watch and clock products exports in 1986. In actual value terms it came to HK$203M. In this category, watch and clock parts constituted 10% of the exports. Watch cases and parts constituted 4.5%. One factor contributing to the high ratio of material content is that while all through the years, increasing number of watches and clocks manufacturers are beginning to produce their own components and parts, many of them are still engaged in assembling work and they import semi-manufactures at relatively high cost from other countries. In fact many manufacturers expressed that in order to ensure the high quality of their finished products, they would prefer to import some of the

component parts that require high precision technology to make, other than to buy them from local sources. Another reason, of course, is the high cost involved if the manufacturers start to produce their own component parts.

Hong Kong relies wholly on foreign countries, such as Switzerland and Japan, on the supply of watch and clock parts, especially movements. Japan in particular, occupies a 50% market share in this field. As there are no signs that watch and clock manufacturers would invest heavily to produce parts and components, this trend is likely to continue in the near future.

Market Penetration

The watch and clock industries in the past years have been able to build up a network of overseas markets. The major markets in order of importance in 1986 are : (Table 5.7)

U.S.A.
China
F.R. Germany
Japan
U.K.
France
Canada
Switzerland
Panama
the Netherlands

Chart 5.1 illustrates the slices of Hong Kong's domestic exports of watches and clocks to the major markets and Chart 5.2 the trend of share of Hong Kong's domestic watch and clock exports by the top three markets, namely the U.S.A., F.R. Germany and China.

Table 5.7

HONG KONG'S DOMESTIC EXPORTS OF WATCH AND CLOCK PRODUCTS BY MAJOR MARKET
(1980 - 1986)

Value HK$ Mn

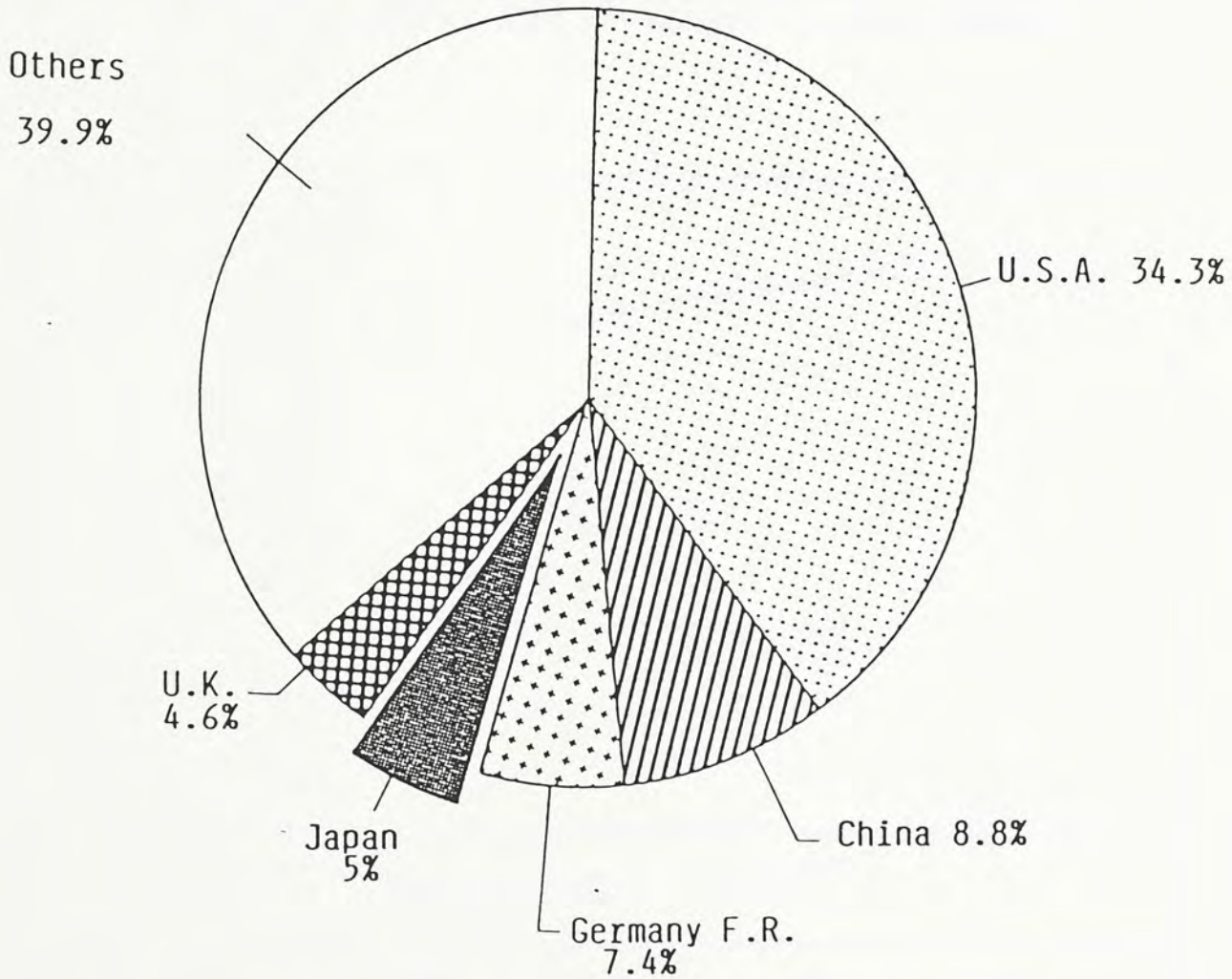
Major Markets	1980	1981	1982	1983	1984	1985	1986
U.S.A.	1,619.7	1,947.1	2,509.0	3,078.8	3,469.0	3734.5	3,887.0
	(25.8)	(27.4)	(35.0)	(37.3)	(39.1)	(41.1)	(34.3)
F.R. Germany	622,7	520.8	467.4	587.8	597.0	559.8	839.7
	(9.9)	(7.3)	(6.5)	(7.1)	(6.7)	(6.2)	(7.4)
Japan	235.3	218.7	232.3	325.2	402.6	394.2	570.9
	(3.7)	(3.1)	(3.2)	(3.9)	(4.5)	(4.3)	(5.0)
U.K.	457.7	366.9	322.7	372.6	392.4	362.7	520.4
	(7.0)	(5.2)	(4.5)	(4.5)	(4.4)	(4.0)	(4.6)
China	148.6	372.4	274.8	334.6	386.9	733.0	995.7
	(2.4)	(5.2)	(3.8)	(4.1)	(4.4)	(8.1)	(8.8)
Netherlands	161.0	224.2	217.2	249.3	368.9	221.6	243.6
	(2.6)	(3.2)	(3.0)	(3.0)	(4.2)	(2.4)	(2.2)
Canada	190.3	224.8	239.3	254.0	259.0	231.7	270.3
	(3.0)	(3.2)	(3.3)	(3.1)	(2.9)	(2.6)	(2.4)
Panama	220.8	289.0	221.8	177.4	247.0	209.5	254.6
	(3.5)	(4.1)	(3.1)	(2.1)	(2.8)	(2.3)	(2.2)
Switzerland	211.6	200.3	186.9	271.7	221.6	213.7	268.7
	(3.4)	(2.8)	(2.6)	(3.3)	(2.5)	(2.4)	(2.4)
France	292.6	248.2	159.8	162.8	217.6	233.0	442.2
	(4.7)	(3.5)	(2.2)	(2.0)	(2.5)	(2.6)	(3.9)
Others	2,128.0	2,491.9	2,306.5	2,445.1	2,313.3	2194.6	3,030.4
	(33.8)	(35.1)	(32.8)	(29.6)	(26.1)	(24.1)	(26.7)
Total	6,288.3	7,104.3	7,167.7	8,259.3	8,875.3	9088.3	11323.5
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)

Note:
Figures in brackets denote the share of domestic exports by maior markets

Source: Hong Kong Trade Statistics. Census and Statistics Department

Chart 5.1

EXPORTS OF WATCH & CLOCK PRODUCTS BY MAJOR MARKETS, 1986

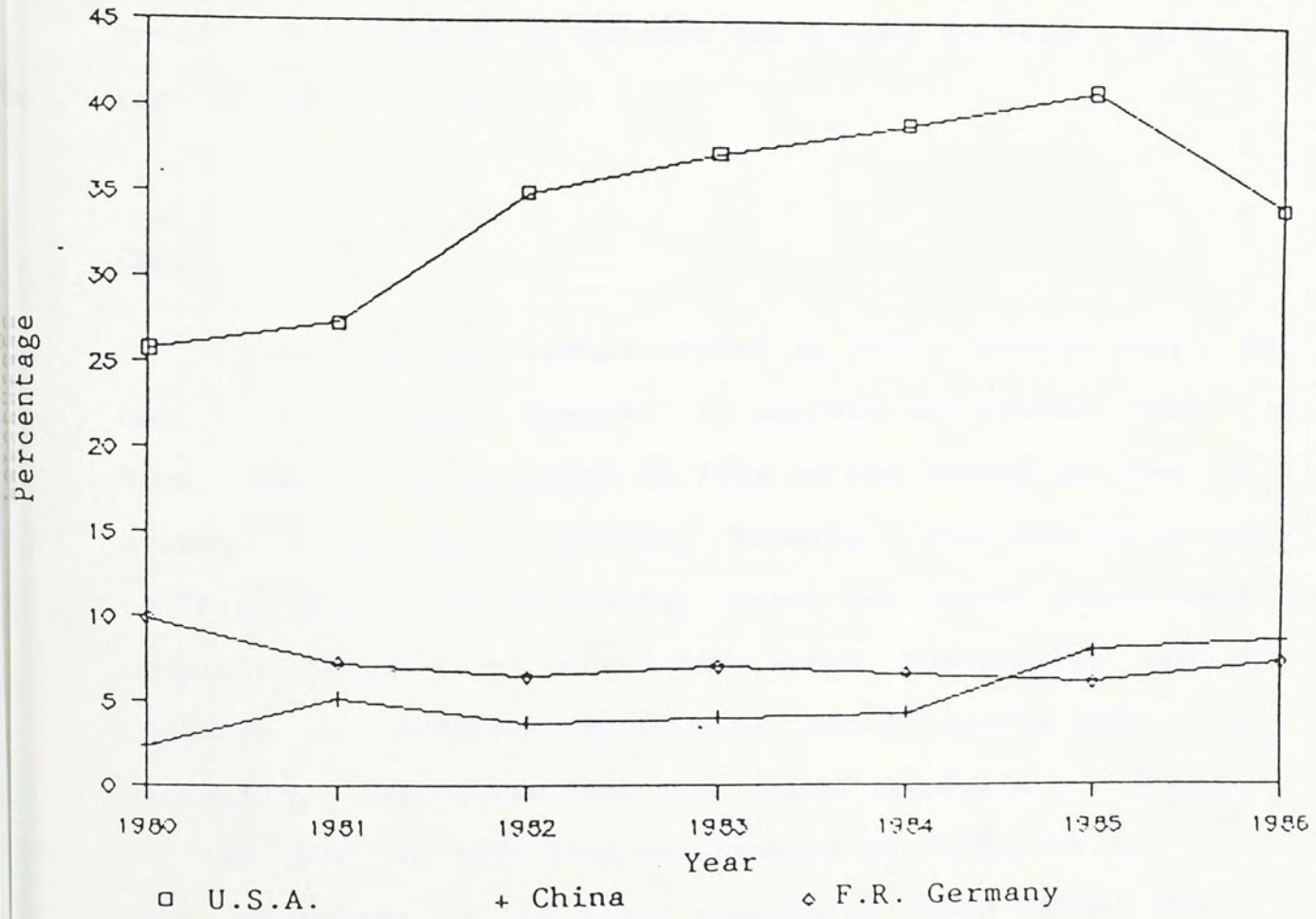


Total Domestic Exports : HK$11,323 Million

Sources : Hong Kong Trade Statistics

Chart 5.2

PERCENTAGE SHARE OF HONG KONG'S DOMESTIC EXPORTS
OF WATCHES AND CLOCKS BY THE TOP 3 MAJOR MARKETS



Evaluation on selected markets

U.S.A.

From Table 5.7, it is worth noting that U.S.A. is the largest market for Hong Kong watch and clock products. Its share of our domestic exports has increased each year from 25.8% in 1980 to 41.1% in 1985, only to decline to 34.3% in 1986. The other markets lagged far behind the demand of U.S.A.

Hong Kong is consistently the second largest supplier of watch and clock products to the U.S.A. with a share of 26.3% of total U.S. imports of watches and clocks in value terms, just behind Japan. (Table 5.8)

China

China, though ranked second in 1986, shares only 8.8% of Hong Kong's domestic exports in watches and clocks. China jumped from the fifth position in 1984 to the second in 1985 with a strong 113% growth to HK$824M. However, over 90% of the exports to China were watch movements, cases and parts, since imports of complete watches to China are under restriction and import licences are difficult to obtain. These exports were related to increasing subcontracting or other production arrangements carried out by Hong Kong watchmakers in factories in China to take advantage of the lower production cost there. After the assembling processes, assembled movements are then shipped back to Hong Kong for local consumption or shipment overseas.

Table 5.8

U.S. IMPORTS OF WATCHES AND CLOCKS BY MAJOR SUPPLIERS 1980 - 1985 (IN US DOLLARS '000)

	1980		1981		1982		1983		1984		1985	
Major Suppliers	Value	% Share	Value	% Share	Value	% Share	Value	% Share	Value	% Share	Value	% Share
Japan	305,826	27.8	418,197	32.8	306,910	31.0	336,049	31.8	437,541	34.9	490,261	34.9
Hong Kong	279,220	25.4	325,174	25.5	246,239	24.8	359,341	34.0	357,835	28.5	369,224	26.3
Switzerland	206,825	18.8	200,550	15.7	156,656	15.8	153,645	14.5	209,242	16.7	259,099	18.4
F.R. Germany	51,840	4.7	49,370	3.9	43,039	4.3	40,454	3.8	55,322	4.4	74,453	5.3
Philippines	25,799	2.3	32,703	2.6	46,435	4.7	23,314	2.2	36,313	2.9	66,380	4.7
Rep. of Korea	36,934	3.4	36,072	2.8	15,873	1.6	24,638	2.3	42,256	3.4	45,601	3.2
Taiwan	93,256	8.5	89,548	7.0	98,136	9.9	69,984	6.6	69,711	5.6	44,930	3.2
Others	98,666	9.1	124,856	9.7	78,033	7.9	50,947	4.8	45,954	3.6	56,217	4.0
	1,098,366	100.0	1,276,470	100.0	991,321	100.0	1,058,372	100.0	1,254,174	100.0	1,406,165	100.0

Source : U.S. General Imports and Imports for consumption (FT135)

F.R. Germany

Hong Kong also has a strong foothold in F.R. Germany which has long been the second largest market until 1985 when it was surpassed by China. Exports in value terms registered an impressive growth of 50% in 1986 as a result of the strong Deutsche Mark and economic recovery.

Japan

Exports of watches and clocks to Japan in the past few years have been growing considerably though there was no gain in 1985. In 1986, value terms and the share in domestic exports had increased due to the strong Yen. Much of the increase for the past few years was actually increased shipments from the Japanese subsidiaries or joint ventures in Hong Kong. While Japan's domestic production concentrates on the medium to high end ranges, Hong Kong have started to break into the lower end market to fill the gap.

From the above analysis, it can be seen that markets for the Hong Kong watch and clock products have started to even out due to the new economic order caused by the weak U.S. Dollars to which Hong Kong Dollars are pegged. This trend will continue in view of the growing importance of the traditional markets like Japan and China.

If the E.E.C. countries really merge in custom duties and economic policy in 1990, the growing importance of exports to E.E.C. countries can be anticipated.

Market Absorption of Products by Type

Quartz Analogue Watches

For electronic quartz analogue watches, U.S.A. was the leading market, absorbing 44% of the total in 1986. The F.R. Germany and the U.K. were respectively the second and third largest markets, with 8.6% and 5.9% of the total. Other important markets included Japan, Canada and Spain. Switzerland's share was relatively small at 1.7%.

Electronic Digital Watches

The U.S. was also the leading market with a 35% share. Other major markets were Japan, F.R. Germany, Austria, and Spain. The E.E.C. as a whole took up about 21%, while Switzerland only had 1.6% of the total.

Mechanical Watches

Mechanical watches were the third largest category of Hong Kong's export of complete watches. U.S.A., the top market, absorbed one third of this amount, and registered a 27% increase in value. Other major markets included F.R. Germany, the Netherlands, Panama, and the U.K. Switzerland's share was small at 1.5%.

Clocks

Hong Kong's total domestic exports of clocks amounted to HK$986.7 million from January to December 1986, up 25% from 1985. The U.S. was the leading market, accounting for almost 40.5% of the total. Exports of clocks to this market however dropped by 2% in the same period. As a group, the E.E.C. registered a spectacular 64% growth, resulting in an expanded share of 42% of the total. France contributed considerably to this growth by registering a 106% increase in value. It was now the second largest market for this item. F.R. Germany and the U.K. were also major markets in the Community, both of them showing strong growths.

Among these items, the performance of electronic clocks showed an upturn of 35% in 1986 compared to the 35% drop in 1985. Most of the major markets including F.R. Germany, France, Canada and the U.K. demonstrated reinforced buying though the U.S. market was growing at a somewhat slower pace.

Imports of Movements

A great proportion of the watch and clock movements, modules, parts and cases used by the industry is imported. Hong Kong's imports of movements , parts and cases amounted to HK$4,979 million in 1985 which represented an increase of 67% from 1984. In 1986, such imports registered a 32.7% growth over 1985 to HK$6,609 million.

Japan is the largest supplier for assembled electronic watch movements, watch cases and parts, assembled electronic clock movements, clock cases and watch parts. China is the second largest supplier of watch cases and parts and the major supplier for clock parts. It should be noted that the increased supply of watch and clock movements from China is largely due to semi-processing activities in China, especially in the southern province of Guangzhou and Shenzhen Special Economic Zone. Table 5.9 sheds light on this.

Imports of parts and components are likely to increase at a steady rate due to the forseeable continual reliance of overseas supplies and stronger derived demand from bouyant exports as a result of the weak Hong Kong dollar.

Export Unit Value

Prices dropped tremendously in the past few years as parts and components prices slipped over the period due to over-supply. However, this favourable factor is the same for all competitors leaving labour and land costs as the vital elements to outcompete the others in terms of prices. Production in China has been the quickest ideal solution.

From the unit value index in Table 5.10, it can be seen that prices of watches and clocks dropped 14% in 1985 compared with 1981 while prices of all domestic exports had risen to 131.[5]

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5 1981 is the base year (100). Annual Digest of Statistics 1986. Census and Staticstics Department, Hong Kong.

Table 5.9

HONG KONG'S IMPORTS OF PARTS AND COMPONENTS OF WATCHES AND CLOCKS BY ITEM BY MAJOR SUPPLIERS (1985 - 1986)

Description	Ranking 1985	Ranking 1986	1985 Value	1985 % Share	1986 Value	1986 % Share	% Change 85/84	% Change 86/85
Electronic watch movements, assembled			1,403,762	100.0	1,818,030	100.0	+ 67	+ 30
Japan	1	1	728,779	51.9	1,098,594	60.4	+116	+ 51
China	2	2	420,374	29.9	522,123	28.7	+ 60	+ 24
Thailand	3	3	132,407	9.4	62,935	3.5	+ 65	- 52
Other watch movements, assembled			1,250,521	100.0	1,712,889	100.0	- 6	+ 37
Japan	1	1	667,393	53.4	962,572	56.2	- 2	+ 44
Switzerland	2	2	124,932	10.0	210,561	12.3	- 20	+ 69
China	3	3	109,712	8.8	120,453	7.0	+ 10	+ 10
Watch cases & parts thereof			360,319	100.0	399,371	100.0	+ 9	+ 11
Japan	1	1	201,719	56.0	172,118	43.1	+ 9	- 15
China	3	2	50,594	14.0	96,290	24.1	+ 74	+ 90
Taiwan	2	3	64,623	17.9	71,400	17.9	- 10	+ 10
Electronic clock movements, assembled			90,345	100.0	157,799	100.0	+ 77	+ 75
Japan	1	1	41,611	46.1	74,110	47.0	+ 50	+ 78
China	2	2	38,424	42.5	72,843	46.2	+410	+ 90
Taiwan	3	3	5,710	6.3	5,844	3.7	- 21	+ 2
Other clock movements, assembled			4,036	100.0	20,247	100.0	- 57	+402
Japan	1	1	3,290	81.5	17,863	88.2	- 47	+443
China	3	2	240	5.9	795	3.9	- 53	+231
Taiwan	4	3	95	2.4	566	2.8	- 86	+496
Clock cases & parts thereof			4,059	100.0	4,895	100.0	+ 56	+ 21
Taiwan	1	1	1,641	40.4	3,463	70.7	+ 28	+111
Japan	2	2	1,206	29.7	942	19.2	+104	- 22
China	3	3	1,158	28.5	483	9.9	+500	- 58
Watch parts, n.e.s.			1,704,030	100.0	2,269,957	100.0	+ 16	+ 33
Japan	1	1	959,053	56.3	1,104,763	48.7	+ 17	+ 15
Switzerland	2	2	288,929	17.0	419,026	18.5	+ 10	+ 45
China	5	3	75,461	4.4	294,127	13.0	+ 8	+290
Clock parts, n.e.s.			161,865	100.0	225,931	100.0	- 44	+ 40
China	1	1	62,069	38.3	95,618	42.3	- 69	+ 54
Taiwan	2	2	57,444	[illegible]	79,527	35.2	- 43	+ 38
Japan	4	4	17,903	+	33,363	14.8	- 61	+

Table 5.10

HONG KONG DOMESTIC EXPORTS OF WATCHES AND CLOCKS
UNIT VALUE INDEX

	1981	1982	1983	1984	1985
Watches and clocks	100	92	95	94	86
All domestic exports	100	106	117	131	131

Gross Output

To appraise the contribution of the Hong Kong watch and clock industries from another perspective, their gross output relative to the total gross output of the manufacturing industries are analysed.

As depicted in Table 5.11, the gross output of watch and clock industries grew from HK$4,952M to a peak of HK$10,261 in 1983. The percentage share of all manufacturing industries' gross output had risen from 5.1% to 6.5%. Figures of the latest Survey of Industrial Production held in 1984 are not used since output of one of the most important item, the electronic watches and movements, is missing for unknown reasons.

The share of watch and clock's gross output grew to a peak of 7.6% in 1981 and then dropped gradually to 6.5% in 1983. It is obvious that other industries have outgrown the watch and clock industries.

Other than the changes in output level, the changes in product mix are also depicted in Table 5.11. Gross output of mechanical watches reached its peak in 1981. However in 1984, the output value is only half that of its peak year. Electronic watches and movements have shown an extremely strong growth from 1979 to 1983. Although this resembles the export performance, it should be borne in mind that the value of sales are not directly comparable with the domestic export figures as a substantial amount of products are sold to local consumers or establishments.

Table 5.11

STATISTICS OF PRODUCTS SOLD AND INDUSTRIAL SERVICES RENDERED BY ALL WATCH AND CLOCK MANUFACTURING ESTABLISHMENTS 1979 - 1984 GROSS OUTPUT (HK$'000)

	1979	1980	1981	1982	1983	1984
Products Sold						
Metal watch bands	636,478	797,471	662,041	749,165	565,283	720,799
Mechanical watches & Movements	1,612,411	2,409,804	3,225,666	1,573,437	1,772,521	1,580,161
Electronic watches & Movements	2,703,586	3,532,760	4,573,068	5,269,312	6,786,449	N.A.
Metal watch cases	696,363	955,559	1,225,409	838,973	865,392	641,451
Electronic clock digital	N.A.	N.A.	426,243	582,144	781,025	649,561
Industrial Services Rendered						
Fabricating of metal watch bands and parts	N.A.	9,536	12,980	26,477	31,670	18,872
Fabricating of metal watch cases	N.A.	19,391	N.A.	14,133	N.A.	16,135
Fabricating/assembly of mechanical parts for watches and clocks	N.A.	19,165	51,274	24,269	34,537	14,684
Assembly of electronic watches and clocks	N.A.	31,085	84,765	70,207	68,197	117,409
Fabricating of parts for electronic watches and clocks	N.A.	N.A.	N.A.	N.A.	29,333	17,522
Total	4,952,475	7,774,771	10,261,446	9,150,117	10,934,407	
(Percentage share of all mfg. industries)	(5.1%)	(6.7%)	(7.6%)	(6.9%)	(6.5%)	
All manufacturing industries	96,502,798	115,565,503	135,660,644	132,042,647	168,806,997	

By subtracting consumption of materials, supplies and industrial services from the gross output, the census value added is derived. The census value added for mechanical and electronic watches and clocks are depicted in Table 5.12. In aggregate, the mechanical and electronic watches and clocks contributed HK$2,088M to GDP in 1984, representing 3.2% of the total GDP generated by the Hong Kong manufacturing sector.

In the previous years, this percentage was higher. For example, in 1981, the contribution to GDP generated by all maufacturing industries was 4%. Since then, the absolute contribution had become steady, falling slightly in 1982 and picking up again in 1983 and 1984. Although the growth rate of the watch and clock industries with respect to all maufacturing industries' GDP contribution appears to be rather small, it remains a positive contributor to the economy.

Establishments

In line with the rapid growth of exports, the industry also expanded in terms of the number of establishments. In December 1975, there were 237 manufacturers. In 1985, there were 1,449 establishments, representing a six-fold increase compared with 1975. This made up 3% of total manufacturing establishments in 1985. Table 5.13 depicts this with Chart 5.3 illustrating the trend from 1975 to 1985. The watch and clock industries are characterised by a large number of small to medium size factories. Over 90% of the factories in this industry employed less than 50 workers while only 4 factories have an employment

Table 5.12

MANUFACTURE OF WATCHES AND CLOCKS
CENSUS VALUE ADDED (HK$'000)
(1979 - 1984)

	1979	1980	1981	1982	1983	1984
Mechanical	619,655	990,782	1,128,990	634,680	695,841*	608,893*
Electronics	410,984	502,987	871,303	1,172,060	1 213,343*	1,479,241*
Total	1,030,639	1,493,769	2,000,293	1,806,740	1,909,184	2,088,134
All Manufacturing Industries	29,465,515	35,609,542	44,290,178	44,903,865	51,154,864*	64,968,063*

*As the "Changes in the book value of stocks of materials/supplies and goods for resale" are missing, figures are approximated by subtracting "purchases of materials, supplies and industrial services" from "gross output". This affects accuracy of data to a small extent as the change in stock/supplies is comparatively small.

Table 5.13

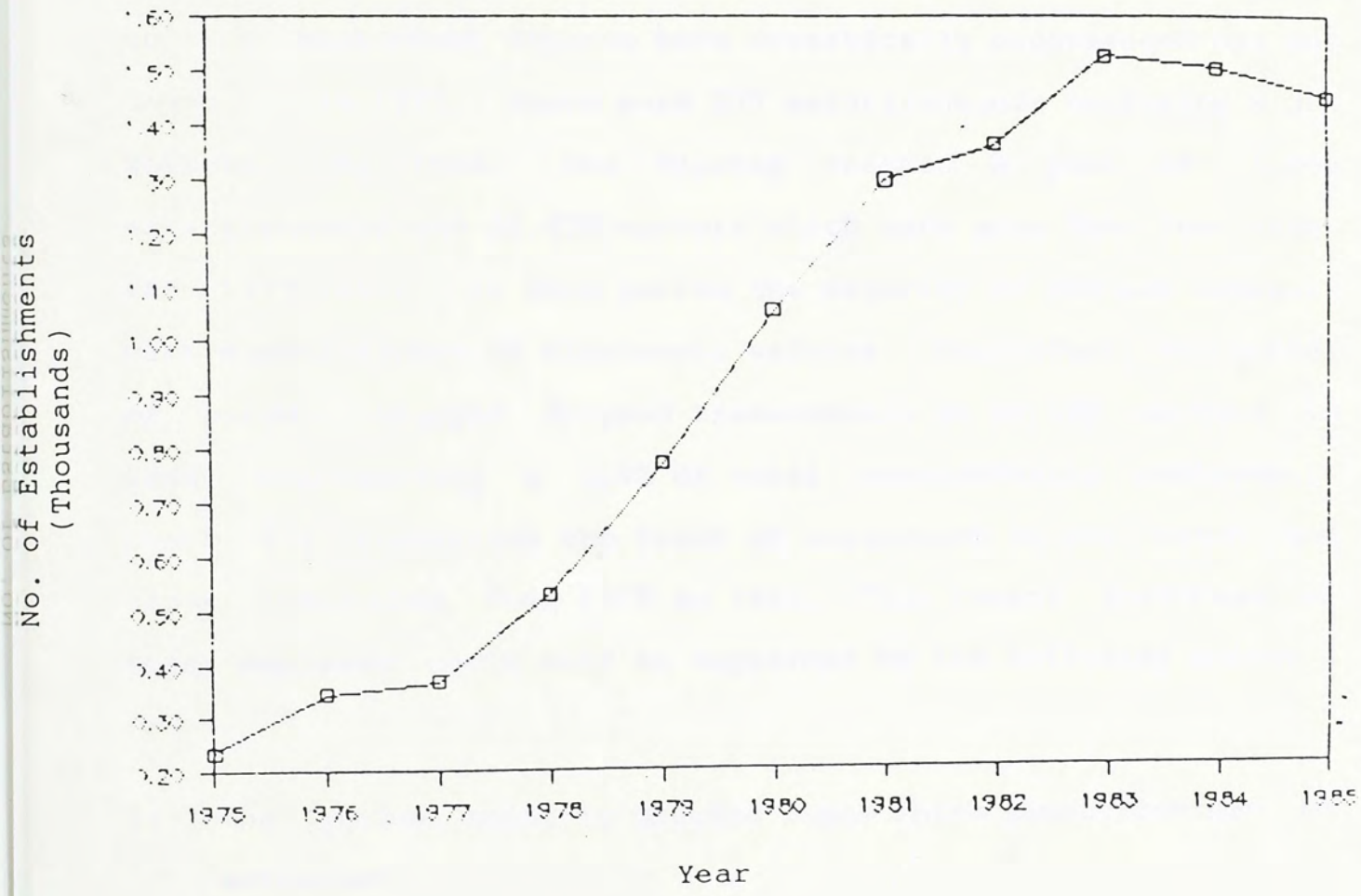
HONG KONG WATCH AND CLOCK INDUSTRIES

NUMBER OF ESTABLISHMENT AND
NUMBER OF PERSONS ENGAGED
FROM 1975 - 1985

Year	No. of Establishment	No. of Persons Employed
1975	237	9,393
1976	345	12,880
1977	368	15,326
1978	530	21,182
1979	770	31,931
1980	1,054	40,478
1981	1,296	40,362
1982	1,361	38,358
1983	1,527	37,992
1984	1,505	36,326
1985	1,449	33,198

Chart 5.3

NUMBER OF ESTABLISHMENTS OF THE HONG KONG
WATCH AND CLOCK INDUSTRIES 1975-1985



size larger than 500. The existence of a large number of small and medium size manufacturers on one hand offers overseas buyers more varieties in supply and on the other hand allows great production flexibility.

Employment

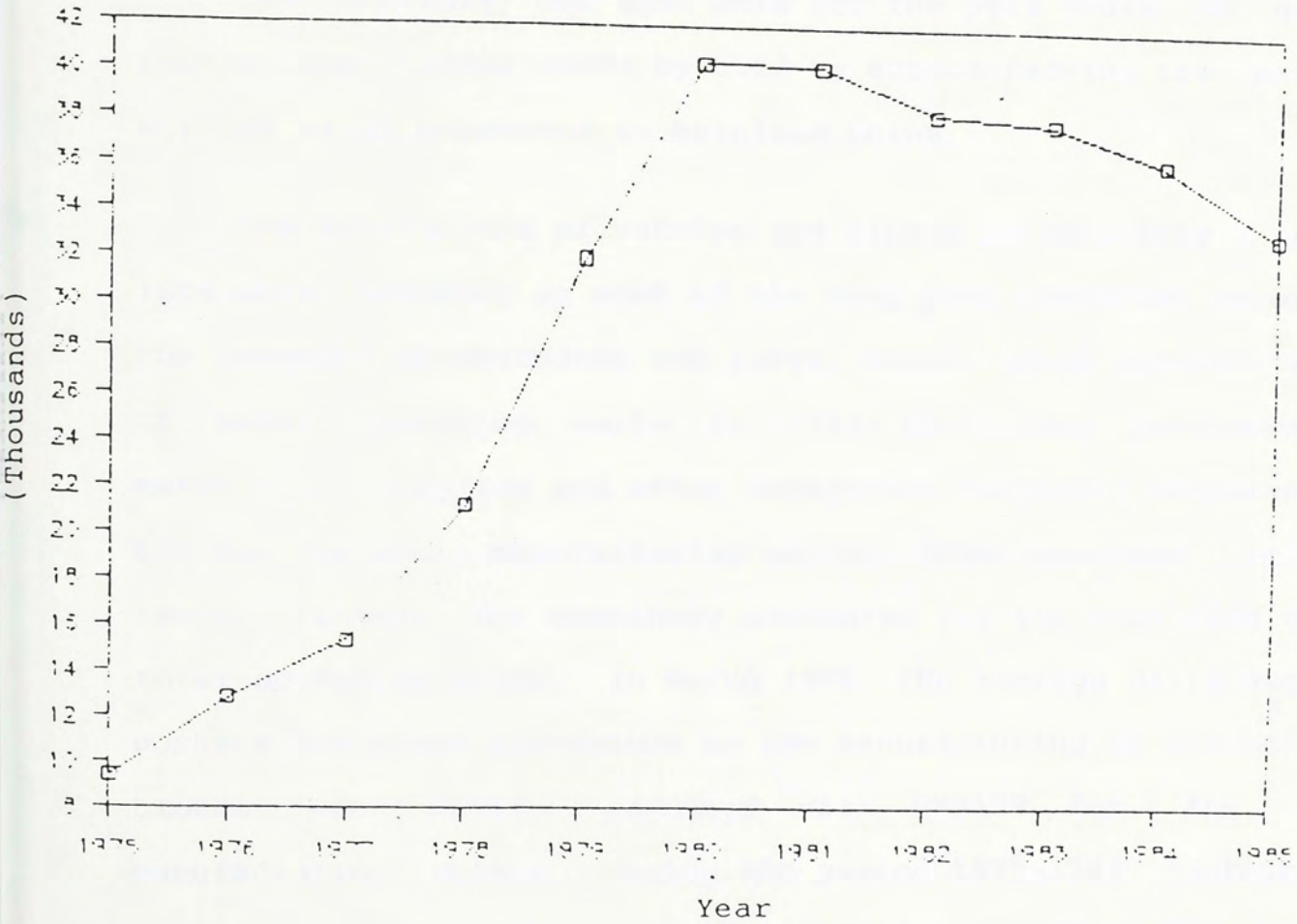
Referring back to Table 5.13,, during the period from 1975 to 1985, employment figures have dramatically experienced ups and downs . In 1975, there were 237 establishments employing 9,393 workers. By 1980, the figures reached a peak of 1,054 establishments and 40,478 workers which were more than four times the 1975 level. In this period the majority of the new entrants were manufacturers of electronic watches. Thereafter, the number of persons engaged dropped tremendously to 33,198 workers in 1985, representing a 3.9% of total manufacturing employment. Chart 5.4 illustrates the trend of employment in the watch and clock industries from 1975 to 1985. This recent shrinkage of total employent could well be explained by the following points :

1) the gradual shift to plastic cases which production can be automated.

2) More and more manufacturers are taking advantage of the cheap labour in China and subcontract the assembly of watches to China. This can be illustrated by the fact that China is the second largest market for watch parts and components.

Chart 5.4

NUMBER OF PERSONS ENGAGED IN THE HONG KONG WATCH AND CLOCK INDUSTRIES (1975-85)



3) Facing rising labour and land costs, some manufacturers introduced automation and computerisation into their production process in order to reduce cost and at the same time increase productivity and enhance quality control.

Cost Structure

The industry has been able for the past years to greatly reduce the labour costs by half by subcontracting the assembly work of watch movements to mainland China.

The manufacture of watches and clocks is basically a labour-intensive industry as most of the Hong Kong factories involve in the assembly of movements and parts. Labour costs represented 69% of total operating costs in 1984 (excluding purchases of materials, supplies and other industrial services) compared with 66% for the whole manufacturing sector. Other expenses, including rents, rentals for machinery accounted for the remaining 31% of total operating costs. In March 1986, the average daily wage for workers and other operations in the manufacturing of watches and clocks was HK$93, compared with HK$103 for the whole manufacturing sector. During the period 1979-1984, output per worker of the watch and clock industries showed a 92% nominal growth (or a 46.5% real growth) from HK$174,900 to HK$336,100, according to government statistics.

Price

Both LED and quartz analogue watches have undergone great price reduction since 1981 due to the highly competitive nature of the business. Table 5.14 below shows the average unit price of each item from 1981 to 1986 for comparisons :

Table 5.14

AVERAGE UNIT EXPORT PRICE OF WATCHES 1981-1986
(IN HONG KONG DOLLARS)

	1981	1982	1983	1984	1985	1986
Digital watches	27.70	17.98	14.09	10.92	8.45	8.02
Quartz analogue watches	111.0	84.23	89.76	87.59	68.97	72.98
Mechanical watches	57.69	52.37	50.50	48.06	37.76	40.00

From 1981 to 1986 digital watches have suffered a 71% decrease in price whereas quartz analogue watches have only experienced a 34% decrease and price of mechanical watches dropped 30% in this period. The decrease in prices was caused by:

1) Mass production and higher labour productivity which lowers the unit cost of production.

2) Dumping of electronic parts and components for watches by the Japanese.

Overseas Investment

Overseas investment is also a feature in the clock and watch industries. At the end of December 1984, there were 30 watches and clocks factories known to be wholly or partly owned by overseas interest. These factories, with a total direct overseas investment of HK$5,556.3M, employed over 4,000 workers. The leading source country of investment is Japan, with interest in 134 establishments and an investment amounting to HK$494.3M. In 1985, however, as labour costs have increased in Hong Kong and as the manufacturing process becomes more amenable to automation, the Japanese companies are changing their strategy. It now appears that fully automated processing will be used in Japan within a few years. New investment and joint venture with Japan is getting less and less.

In 1986, there were 32 establishments engaged in watch and clock manufacturing set up by overseas investment. Out of these, 21 were wholly-owned by overseas interests and 11 were joint-ventures between Hong Kong and overseas interests.[6]

Of these foreign investments, over 50% are engaged in the manufacture of electronic watches. The rest are involved in the manufacture of mechanical watches, movements, watch cases and parts.

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6 Report on the Survey of Overseas Investment in Hong Kong's Manufacturing Industries 1986. Hong Kong Government Industry Department. Published in 1987.

In 1985, the total direct overseas investments has increased to HK$603.9M with Japan having interest in 16 factories employing 2,367 workers and an investment amounting to HK$539.9M (8% of total).

Cooperation with Mainland China

In 1986, China has become the second major market of Hong Kong watches and clocks representing 8.8% of Hong Kong's domestic exports. This trend, as shown in Table 5.15, is mainly due to the increase in sub-contracting work in China which resulted in the flow of watch components to China for further assembling and assembled movements shipped back to Hong Kong.

It is to the mutual benefit of China and Hong Kong to enhance this cooperation.

As in the case of China, the recent thirty years' development of watches and clocks in China has been slow and backward. The style of the watches and clocks are old and limited therefore the Chinese products cannot satisfy the demand of overseas markets. In addition, the Chinese lack up-to-date business information on taste of consumers and changes of the development of overseas markets. They also lack the basic marketing technique to penetrate into the world market. Most vital of all, the Chinese trading practice is widely known to be slow and bureaucratic.

Nevertheless, China can provide cheap but skilled labour for mechanical watch assembly. Their production capacity is at

Table 5.15

IMPORTS OF WATCH AND CLOCK MOVEMENTS FROM CHINA
1978 - 1985 (IN QUANTITY)

	1978	1979	1980	1981	1982	1983	1984	1985
Watch Movements (Electronic)	-	1,426,574	2,929,912	6,082,031	20,848,258	39,171,789	61,034,448	126,310,584
Watch Movements (Others)	10,000	1,091,477	5,351,767	9,170,570	4,383,941	7,052,433	7,695,850	8,165,773
Clock Movemets (Electronic)	-	-	-	300	132,548	654,507	655,953	2,348,562
Clock Moveents (Others)	-	7,000	13,000	20,200	22,500	20,265	45,362	21,177

Source : Census and Statistics Department, Hong Kong Government

4,500,000 mechanical watches and 3,500,000 mechanical clocks a year. With some simple training, the Chinese workers are able to assemble electronic watches though less efficient when compared with the Hong Kong workers. Other than these, China can provide land and factory premises at a much cheaper cost.

Hong Kong seems to be a good compliment and partner in the following aspects. Land and labour are both expensive in Hong Kong and the manufacturers can take advantage of cheaper land and labour in China. Hong Kong can provide China with the necessary technical training of watch assembling to the Chyinese workers. Furthermore, through the network of long established overseas markets, Hong Kong is able to provide information of the latest changes in demand and taste of overseas consumers. Most important of all, Hong Kong is a free port with no customs duty and the sophisticated infrastructure provides efficient distribution channels for exports to the rest of the world. In 1987, there are around 30 companies having some sort of clock and watch assembling work in Mainland China.

The cooperation however are not without problems. First of all, there is a problem of foreign exchange. With the control of foreign exchange in China, import of production machines, components and parts will mean an outflow of reserve funds. In the case of compensation trade, the export of complete watches and clocks will tend to balance the payment. However, there is still the time lag and if part of the watches are for local sale, the problem will be aggravated.

Secondly, both Hong Kong and China are unable to produce good quality integrated circuits, some of the electronic parts and components. These have to rely on imports mostly from Japan and Switzerland.

Tax and Fees are another problem area. The fees charged by the cooperatives are sometimes unreasonably high, as complained by many local manufacturers, such as labour insurance and welfare funds. These have in fact offset some of the benefit from cheap labour.

Another aspect is labour quality. According to a watch manufacturer, productivity is comparatively low in China. Productivity for a factory with 50 workers in Hong Kong is 200,000 to 300,000 watches per year , whereas ironically, productivity for a factory with 300 workers in China is only 100,000 - 200,000 watches per year.

Last of all, lack of or insufficient transport and communication networks, inexperienced international trade practice and red-tape in document processing all have caused delay in delivery of goods.

Summarising the above analysis, co-operation with China to a certain degree is restricted. The various problems have to be looked into seriously by China with a view to improve or resolve them.

Strategies

In 1978, Hong Kong took over Switzerland to become the largest watch exporter by quantity. In value terms, it was behind Switzerland and Japan as the third largest watch exporter in 1985. In the fifties, Switzerland produced 70% of the world's total watch and clock production. The birth of electronic watches has definitely brought about a revolution to the Hong Kong watch and clock industries. Hong Kong was quick to realise this opportunity and to devise a strategy to compete with the watch and clock super-powers of the world. The success of Hong Kong in its strategies are analysed and subsequently compared with Switzerland and Japan below.

Market positioning

Hong Kong positioned herself at the low end of the market, a sector where there were much room for growth. The change of consumption patterns in the 70's provided an opportunity for cheaper disposable items including watches. On the other hand, cheaper watches further induced this spend thrift habit of the Western, especially the American, consumers. Realising this opportunity, Hong Kong has been striving to keep production cost low by mass production. To the furthest extent, they set up assembly plants in China to take advantage of cheaper land and labour there.

Japan with brandnames like Seiko and Citizen positioned herself in the medium market range as their quality is far higher

and prices higher than that of Hong Kong. Japan once intended to challenge Switzerland by introducing the high-end "Lasalle" range of Seiko watches. However, this had been proved not successful since the Japanese watches have always been perceived as second-rate to those made in Switzerland. The medium end market is largely dominated by the Japanese.

Switzerland, on the other hand, positioned herself at the high end of the market. It produced 85% of the delux famous brand watches such as Patek Philippe, Audemars Piguet, Cartier and Rolex, etc. Almost all world famous jewellery watches are made in Switzerland who is determined to keep the tradition of fine workmanship. "swatch" is an attempt of the Swiss watch manufacturers to regain its position in the medium to low end markets. Although this is a great success as a fashion accessory, the medium and low ends are still dominated by Japan and Hong Kong respectively.

Innovations

All three countries knew the importance of innovation. However, Hong Kong lagged behind Switzerland and Japan in this respect. Switzerland continued to improve the mechanics of watch movements and using new metals like Titanium and new material like granite rock for watch cases.

Japan innovated new watch and clock products at all times. The Japanese made the first LCD and the first quartz analogue watch in the 1970's. These innovations had great impact on the

world watch market and were the compass of the Hong Kong watch manufacturers. With their strong R & D, in 1983, the Japanese innovated the first computer watch, followed by the solar watch, radio/TV watch and quartz analogue alarm watch, etc.

R & D of the watch and clock industries in Hong Kong has never been particularly emphasised. Only a few of the large manufacturers have invested in R & D. Innovations are limited only to new electronic gadgets and add-ons to existing designs. The following is a list of examples of some new "innovations" :

LCD watch with alarm (1977)
LCD watch with alarm, timer and dual time function (1978)
LCD watch with 30-second melody alarm (1979)
LCD watch with user-programmable memory for entering and displaying personal notes (1981)
Talking watch with voice synthesizer to announce time (1982)
FM radio watch (1982)
Translator watch (1983)
LCD watch with thermometer (1983)
Water watch (1987)

These gadgets commonly have very short product life cycle hence manufacturers generally are unwilling to invest in R & D in Hong Kong. By making use of the available technology from Switzerland and Japan, Hong Kong is emphasising on new watch and clock designs instead. This is particularly so after the copyright incident in 1983 when 50 Hong Kong manufacturers were involved in copyright infringement allegations . They were forced to realise that this is the only way to survive and prosper. Since then, the Hong Kong Watch and Clock Design Competition which started in 1984 had proved successful in arousing interest in design of watches and clocks among Hong Kong manufacturers.

Diversification

Switzerland, Japan and Hong Kong all realised the need for diversification, either in product lines, markets or into other business. Switzerland diversified into other ranges of product. "Swatch" was introduced with a new concept mix of choice of colours, unique fashionable style, anti-shock and waterproof. It also led the fashion concept in watch.

Japan realised that the technique for making electronic watches and clocks are easy to be picked up by developing countries by mass production assembly. To tackle this problem, they diversified into other business.

For Hong Kong, continuous efforts were made to formulate strategies to enter into new markets. The Hong Kong Trade Development Council has been very active in the last two decades in helping the Hong Kong watch and clock exporters penetrate the world market. Diversification on different markets help spread and reduce risks.In 1984, exports of watch and clock products to Japan evidenced an increased of 54% as compared with 1983.

CHAPTER VI

FINDINGS AND ANALYSIS

The watch and clock industries have achieved great leaps in domestic exports in the past ten years and become the world's largest producer by quantity since 1978. It ranked fourth among other industries in the Hong Kong domestic exports. This was made possible by the strengths of the Hong Kong watch and clock industries other than the favourable economic environment and infrastructure provided by the Government. The weaknesses of the industries, together with imposing threats, opportunities open to the Hong Kong watch and clock manufacturers and the Government policies are also analysed and evaluated in this chapter.

Strengths

Good Foundation

The development of the industry has a good base to build on. As analysed in the previous chapters, Hong Kong has learnt from Switzerland the basic skills of assembly and manufacturing. Assisted by a number of proficient ancillary or supporting industries such as the electroplating, plastic, printing and button cell industries, the manufacture of watch bands, straps and watch cases, etc., Hong Kong has a firm foundation for the growth.

Ethnic of Hard-work

Hong Kong has an industrious workforce with high productivity and skill. The less stringent labour law in Hong Kong provides flexibility in the utilisation of manpower resources and that the nimble fingers of the Chinese girls particularly suit the watch and clock assembly work.

Absence of Import Duties

Imports of watch and clock movements and parts are duty free and hence will not affect the cost of production and export prices. This is particularly important for the sub-contracting work in China which involve double imports on the books.

Close Link with Overseas Buyers

Hong Kong has close contact with the rest of the world and is able to follow the trend of major markets and adapt the product designs to suit the demand. The long established contacts with overseas customers have cemented good relationships. In many instances, Hong Kong manufacturers are requested to manufacture according to the designs and specifications provided by overseas buyers.

A Space-saving Industry

The watch and clock factories demand relatively less space for its set up and this suit very much Hong Kong which faces acute shortage of land. The storage of finished goods or parts

and components only occupies limited space hence offsetting the unfavourable factor of expensive rent.

Adaptability and Flexibility

Not much investment capital is required for a simple assembling plant, therefore, entrance and exit are rather flexible in that the whole industry can adjust itself according to the situation of world demand in a competitve environment. As a result of this, small scale operations dominate the watch and clock industries. These have enabled the local factories to be highly adaptable and flexible, which are of great importance to the extremely competitive and fast-changing watch and clock markets. Keen competition will always exist therefore this would help maintain the competitiveness of Hong Kong watch and clock products and the quality consciousness of the manufacturers. In addition to this, the strict quality assurance and standards established by major local watch and clock manufacturers have helped established buyers' confidence in Hong Kong products.

Consistent Economic Policy

The Hong Kong Government's consistent economic policy of free trade and free enterprise, coupled with its belief of non-intervention, has cultured a favourable climate for industries to develop and grow according to market demand and to their adaptability. This policy, however, does have its drawbacks which is analysed in the section on Government policies.

Good Infrastructure

The strategic position of Hong Kong in the Far East has also enabled a good international air and sea transport for the industry. Communication is efficient with a worldwide network of international telephones, cables, telexes and facsimiles provided by Cable and Wireless. Excellent shipping and cargo handling facilities, banking and insurance system has facilitated and helped the growth of exports. Import and export procedures are simple as compared with other countries and with no exchange control, proceeds are free to be remitted in and out of Hong Kong.

Weaknessess

Dependence on Imports of Parts and Components

Hong Kong is overdependent on the overseas suppliers on watch movements, parts and components. As Hong Kong practically produce negligible amount of watch and clock parts and components, she has to rely on foreign made supplies. Japan is the number one supplier of electronic watch movements, mechanical watch movements, watch cases, watch parts, electronic clock movements, etc. Switzerland is the second largest supplier of mechanical watch movements and watch parts to Hong Kong. Over-reliance has the undesirable consequence of having supply of the vital watch parts and components subject to the mercy of the suppliers should trade disputes arise. The prevailing strong Yen and Swiss Francs has seen the damaging effect on overreliance of

overseas supplies. Profits are futher squeezed since the costs of parts and components rocketed but the export prices are quoted and settled in U.S. Dollars.

Weak Marketing

There is generally an absence of brandname for the Hong Kong made watch and clock products. Unlike the Swiss and Japanese, Hong Kong concentrates on the manufacturing process, mostly on OEM basis, leaving the work of marketing and after-sales services to the overseas importers. Relying on import agents on marketing and distribution would mean a lower profit margin to the Hong Kong manufacturers. According to the manufacturers being interviewed, markup for the watch and clock products based on CIF value could be as high as 300% to 400%. However, the majority share have gone to the importers, wholesalers and retail outlets, leaving a disgraceful portion to the Hong Kong manufacturers.

Keen Competition

Keen competition among the Hong Kong manufacturers has driven the gross margin to paper-thin level and in the extreme case, driving each other out of business. The rapid decrease in the number of establishments from 1980 is an evident of cut-throat competition , besides other factors.

Absence of Government Assistance in R & D

The Government non-intervention policy has left the industrial development on its own. The generally small factories

in the watch and clock industries thus receive no assistance in research and development nor policy guidance. They thus lag behind other large competitors in Hong Kong as well as those from the nearby countries like Taiwan, Korea and Singapore which generally receive government assistance.

Labour-related Problem

The labour market for this industry is shrinking due to competitiion from other industries like textiles, electronics, banking, trading and other `white collar' work. This has resulted in a higher labour cost, higher labour turnover and a shortage of skilled labour in general. The vicious cycle repeats itself thus aggravating the situation making the enrolment of workers even more difficult. Hong Kong competes with other countries with its cheap price, the increase in labour costs will push the prices up thus reducing the competitive edge of the Hong Kong made watch and clock products.

Backward Technology

Technological knowhow is lagging behind that of other countries like Japan and Switzerland. Hong Kong relies a lot on the import of their integrated circuit boards and components. At present only a watch repairing course at technician level is available at Lee Wei Lee Technical Institute and higher level courses are not available. Thus, the supply of technicians is limited. Manufacturers are also unwilling to invest in high technology since initial investment costs are high and the period

for return is long. Political issue of 1997 has casted a shadow over the industrial development in Hong Kong. Manufacturers are uncertain of long term political situations and they are looking for a short term to medium term investment with quicker return. During the interviews, manufacturers revealed that investment on component parts like integrated circuits or stepping motors could be as high as one billion dollars and that many manufacturers were looking for a term of three to five years should they invest on new machineries.

Threats

Over Production and Cut throat competition

Since 1984, the quantity of electronic watch produced have exceeded the demand. Cut throat competition began among the manufacturers. Unit price dropped 30%, total value dropped 30% but quantity increased by 20%. The profit margin was largely eroded by this price cut. Some are even operating at a loss. In the long run, this will only do further harm to the industry. Thus, more unity among local manufacturers are called for to avoid such phenomenon to happen again and to safeguard against harmful competition.

Protectionism

Protectionism is one of the most serious recent threat faced by the manufacturers of Hong Hong.

In 1980, France was the fourth largest market for the Hong

Kong watch and clock industries, but in 1985, it fell to the sixth. This was due to the quota restrictions imposed by the French Government on the imports of watch and clocks from Hong Kong since 1981. Though this quota was only on digital watches for a few years and no longer exists, there is always the fear that other countries will follow suit.

At present, the likelihood that quota auctions be enforced in the United States grows daily as sentiment for protectionism becomes more intense as a result of huge trade and federal budget deficit. This is a system which would allow importers to bid publicly for the right to import specific quantities of restricted goods. If enforced, the exports to the States would be much reduced. In view of the fact that the U.S. is the largest market for the watch and clock industries, the threat looks real and serious.

Patent and Copyright

In 1982, the inventor of Liquid Crystal Display, RCA of U.S.A., claimed that Hong Kong has infringed their patent rights on LCD watches and demanded a royalty of US$0.03 for each LCD watch produced. In 1983, six Swiss watch manufacturers alleged over 50 Hong Kong manufacturers of copying their production. Though these issues were resolved after much negotiation, it was harmful to the image and reputation of Hong Kong as a watch manufacturing centre. In addition, there is always the threat that similar allegations will appear again.

Now that a design deposit service has been set up by the Hong Kong Watches Manufacturers Association, new design drawings can be securely sealed in an envelope and kept strictly confidential. Only in case of dispute and upon the request of the depositor will the Association open the envelope and issue a declaration to certify the date that those designs are deposited.

Overreliance On Major Market

The largest buyer of Hong Kong watch and clock products is U.S.A. In 1980, it accounts for 34% of our exports. The heavy reliance on one large market is in a way risky since a change of demand pattern or economic condition of that country will bring a heavy blow to the industry. Thus, manufacturers are trying to expand their markets or create new ones.

The clock and watch manufacturers attended a number of fairs to promote their products. In 1986, Hong Kong manufacturers were accepted for the first time in the Basle Fair which is the most important annual watch and clock fair in the world. The Hong Kong Trade Development Council has done a lot to promote the watch and clock fairs overseas. There were also the Hong Kong Product Exhibition in Japan and the annual Hong Kong Watch and Clock Fair in Hong Kong. There are buyers from overseas attending these fairs and it is also a golden opportunity to receive orders for the year.

Trade missions were organised to Japan, Switzerland for an exchange of experience and also to establish a better

relationship for more business.

Market Saturation

With the development of the watch and clock industries in the recent ten years, watch is no longer a necessity and has become part of fashion. Fashion designers and automobile companies have also diversified into the watch business with their own brands. The markets have become so saturated that nearly every adult possesses at least one or two watches or clocks. The replacement demand is relatively small as watches and clocks do have a few years' life span. With this special feature, the demand of watches and clocks have become rather elastic, and are vulnerable to the economic well being of the major markets.

Exchange Fluctuation

Exchange rates are proving a mixed blessing for the Hong Kong watch and clock assembling industries. It pushed sales in Europe but gobbled up profit margins due to the increased cost of imported Japanese and European watch and clock movements. Since the G-5 meeting in September 1985, Yen had appreciated from 1 US$ to 243 yen to the rate of 1 US$ to 140 Yen -- a total of 73% increase in value! The movement accounted for 50 - 60 % of the cost of producing a watch. It is thus necessary to book forward contracts to cover this exchange risk exposure. Small companies which do not buy forward always have their low margins eaten off by exchange fluctutations. They may be left with orders which

they will lose later on if completed.

Political Uncertainties

Hong Kong has now entered the phase of transition to 1997. Political uncertainties as to policy changes in the nineties and after 1997 has casted a shadow over the future development of all industries. The watch and clock industries are no exceptions. Industrialists, fearing that their long term investments will bear no fruits, emphasized only on short term investments and quick return. In the long run, this will weaken the competitiveness of Hong Kong in the Asian region. Taiwan, Singapore, and Korea, with their research and development in hi-tech industries, like integrated circuits, can easily overtake Hong Kong's importance in the industry.

Volatile Policies of China

Frequent changes in China's policies concerning co-operation with foreign countries, foreign exchange, etc. underlines a threat towards existing co-operation with mainland China. Hong Kong now relies on China's co-operation for a large portion of watches and clocks assembly. If the policy of China were to change regarding this co-coperation, investments would be jeopardised and more important, it would lose a source of cheap labour, thus again reducing its competitiveness in the world market.

Opportunities

Market Penetration

The overreliance on one large market has its underlying threat as explained before. There is thus a need to penetrate new markets. New market opportunities include the Third World like China, India, Africa and the Middle East, where poverty and their backward economy can only afford them the cheaper mechanical and electronic watches.

For higher priced watches, the opportunity lies in Japan, which is under pressure to open up its domestic market for foreigners. The increased Japanese investment in watch factories in Hong Kong has also enabled direct local procurement of Hong Kong lower end products like mechanical watches and LCDs for shipment back to Japan or for exports to other European countries.

EEC countries, with its growing importance in absorbing Hong Kong watch and clock exports are likely to absorb more of Hong Kong's exports if an aggressive marketing strategy is vigourously pursued.

Market Share

In August 1986, Seiko and Citizen of Japan announced that they would reduce production of both watches and clocks from that month onward. Japan realized the need for controlled and moderate growth of production. This new policy of Japan, coupled with a growing world population, will definitely provide Hong

Kong with an opportunity to take over some market share from Japan.

Further Cooperation with China

If China continues its open policy, it is likely that more co-operatiion with China will take place for mutual benefit. Hong Kong watch and clock manufacturers can make further use of this opportunity to reduce their production costs as cheap land and labour is the basic attraction of such kind of co-operatiion. Furthermore, China is claiming herself to have put emphasis on the development of hi-tech industries, including quartz analogue watch movements. If China is successful, Hong Kong can benefit by the imports of cheaper Chinese parts and components and reduce its reliance on Switzerland and Japan for their supply of parts and components.

Rapid Development of the Electronics Industry

The rapid development of the electronics industry will enable many more innovations and will help to upgrade the quality of electronic components to be used in watches and clocks. The improvement in integrated circuits, printed circuit boards, button batteries etc. will not only help upgrade the watches and clocks but will also stimulate new innovations in the watch and clock industries. The electronic industries have also trained up specialiists in the field who can apply the expertise in the watch and clock industries which nowadays rely much on electronics technology.

Overseas Investment

After the signing of the Sino-British Agreement for 1997, unlike many local manufacturers, many overseas investors feel that there is an opportunity for them to penetrate into the market of China by having some establishments in Hong Kong. They generally believe that the Chinese Government will not do any harm to overseas investments as this will bring in new technology and foreign exchange, in line with their open policy. The appreciation of foreign currencies like Yen, Swiss Francs, Pound Sterling, etc. also makes investments in Hong Kong appears relatively attractive. Some of these investments will move into the watch and clock industries which will escalate the prosperity of these industries .

Evaluation of Government Policy

No Overall Policy

As expressed by most of the manufacturers being interviewed, the Hong Kong Government has no overall policies or plans as to the development of industry, let alone the watch and clock industries. All its industrial legislations and regulations are formulated in response to external forces or to issues raised from within industry on an ad hoc basis.

In 1981, the French Government unilaterally imposed an import quota of 5.5 million pieces from 1st October 1981 to 31st December 1982 on Hong Kong made LCD watches. This had caused

furious reactions from the local watch manufacturers who threatened to organise boycotts of French Congac. Upon the petition of the local watch and clock associations, the Hong Kong Government protested and negotiated with the French Government who later on compromised that the quota restrictions would not be further extended after 31st December 1986.

In July 1985, the watch and clock industries raised the "Markings" issue to the Government. They proposed to follow the policies of countries like U.S.A. and Japan to take the country of origin of watch to be the same as the country of origin of movements and hence to allow markings of the country name on the watches and clocks if the movement contained in the watches or clocks are made in that particular country. Although this would certainly help the exports of Hong Kong made watches and clocks, this proposal was finally defeated in early 1987 as the Government insisted that Hong Kong had to follow U.K. legislations.

Loose System of Support

There is a system of support for industrial development in Hong Kong which consists of Government Departments, quasi-government institutions as well as trade and industrial associations. The more important ones are :

Trade Department

Industry Department

Customs and Excise Department

Labour Department

Hong Kong Trade Development Council

Hong Kong Productivity Centre

Hong Kong Export Credit Insurance Corporation

Federation of Hong Kong Industries

Hong Kong Vocational Training Council

The Chinese Manufacturers Association

Hong Kong General Chamber of Commerce

Hong Kong Management Association

However, the work of each individual element in the system of support is only loosely guided and co-ordinated by statutory or non-statutory boards or committees, thus resulting in duplication of efforts and deficiency of other functions needed for the development of industry.

The Hong Kong watch and clock industries consist largely of small operatives. In a recent study on small scale industries in Hong Kong, it was pointed out that " ... the three major problems faced by small enterprises are labour shortage, unsteady order and limited market, and difficulties in obtaining working capital. Very little assistance is available from the supporting system in these three areas, possibly as a consequence arising from : a) the inability of small industrialists to identify their problems b) the deficient publicity on the part of supporting institutions about their services to small enterprises and c) the lack of awareness on the part of Government as to what is really

needed by industry to further its development."[7]

Non-intervention

It has always been the Government policy not to assist or intervene Hong Kong industry except to enforce the basic trade, labour and safety laws and to provide a good infrastructure. The Government provided only minimal assistance to the manufacturers involved in the copyright incident and RCA royalty claims happened in 1983. These matters were finally resolved by the manufacturers themselves through their two local watch and clock associations.

In contrast to other nearby rapidly developing countries who are also Hong Kong's strongest competitors, the Hong Kong Government appears to be inert. The governments of Taiwan, South Korea and Singapore have actively provided the following services and facilities to their industries in general:

Country	Institution	Services
Taiwan	Industrial Technology Research Institute and National Science Council	Promote applied industrial research
	National Bureau of Standards	Promote industrial standards

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7 Victor F.S. Sit, S.L. Wong and T.S. Kiang. Small Scale Industry in a Laissez-Faire Economy. Centre of Asian Studies, University of Hong Kong, 1979.

	Metal Industries Development Centre and Machine Tool Development Centre	Provide industrial support facilities
South Korea	Institute of science and Technology	Promotes applied industrial research
	Fine Instruments Centre	Provides calibration and related services to the electronics and machinery industries
	Industrial Advancement Administration	Promotes industrial standards
	Scientific and Technological Information Centre	Disseminates information on technological developments to manufacturing industries
Singapore	Institute of Standards and Industrial Research	Provides a wide range of technical back-up services

Based on the brilliant economic development and export performance of especially Taiwan and South Korea, it is fair to say that government assistance to a certain extent definitely helps their export indutries. Although Taiwan and Korea is still lagging behind Hong Kong in the watch and clock industries, it might be possible that they would catch up in the near future with their active government support.

All in all, the Government has not taken a positive attitude towards industry including the watch and clock industries.

CHAPTER VII

RECOMMENDATIONS

Counter-protectionism

Government should provide assistance in bargaining or conduct negotiations with other countries over issues of protectionism. The initiation and response from manufacturers and their association will help solicit public support and to apply pressure on the Government for action. A typical example happened in 1982. In response to the French quota on watches and clocks, the Hong Kong Watches and clocks Manufacturers Association publicly brought public attention on the local press on this issue and pressed the Government for action. At the same time, they initiated an "Anti-French Brandy Campaign" as a response to this unfair imposition of French quotas. A special committee was also set up by 13 manufacturers associations for further actions. The French government, subject to international criticisms and lobbying from French brandy manufacturers eventually compromised on a temporary quota restriction to be expired in 1986.

With the growing threat of protectionism, it seems inadequate for Hong Kong only to tackle the problem as it arises. It is suggested that the overseas Government Offices to launch some PR campaigns to publicise the fact that Hong Kong has in fact no unfair trade practices or any form of trade restrictions. Hong Kong is one of the most liberal ports in the world and should not be treated unfairly as a victim of protectionalism. It

is more efficient to prevent than to employ lobbyists only when restrictions are being imposed.

Design Innovation and Copyright Protection

After the 1983 copyright incident, the watch and clock industries have moved into a new era. They have learnt from the lesson that an industry which merely bases itself on imitation will only be a barrier to development. While imitation is a necessary step in the learning and growing process, a mature industry should try to innovate new style and designs to survive.

Through the interviews, it seems that few knows about a design registration service avaliable from the Design and Packaging Centre of the Design Council in Hong Kong. Under the U.K. Registered Designs Acts 1949-1961, industrial designs registered at the U.K. Design Registry will provide its proprietor in the U.K. sole rights to make or import for sale, hire or use in business such articles bearing the design as registered or a design not substantially different for an initial period of five years. Protection by registration under the Registered Designs Acts is additional to any protection against copying under the Copyright Act 1956 as amended. The proprietor of the design can enjoy in Hong Kong privileges and rights similar to those he enjoys in the U.K. He can take legal action against anyone who makes, imports or sells any article of a similar design within the territory.

It is important to publicise this service to the watch and clock manufacturers to whom copyright protection is getting important as Hong Kong must follow the step to move from a copy cat to a creative watch and clock designer centre, similar to the Hong Kong fashion garment industry.

Bankers Support

Longer term bank finance for R & D should be an encourgement for manufacturers to invest further in the industry. However, banks are often unwilling to do so since they are concerned as to whether these finance would be fruitful and prove profitable to manufacturers. The capital of these manufacturers are often small and are unable to justify and sustain the finance. The solution could be for the Government to provide support and to assure the banks of some form of security to a certain extent in case of default. During the course of their services, banks can also provide expert advice as to how to hedge against exchange rate fluctuations to safeguard the low profit of the manufacturers.

Factory Purchase Finance

Many of the Hong Kong watch and clock factories are run on a small scale and lack the capital to finance a decent factory premise for production. It is a necessary step to improve working conditions to achieve better layout, more efficient production and increased production. To this end, Government should assist in the form of a low cost industrial self-owned factory scheme, basing on the model of 'Home Ownership Scheme' which is non-

subsidizing and non-profit making. This scheme can encourage better commitment of the industry to invest for future productions.

Manpower Training

Except for a few larger watch and clock manufacturers, many smaller enterpreneurs lack the management skill to run a successful business. There is also a general lack of experienced designers and technicians in the industry. More training courses should be organised by technical institutes to provide:

1. Management techniques in feasiblity study, ways and means to run a business successfully, information on the support system and laws and regulations regarding the running of the factory.

2. More training for new designers or advance training for existing designers to improve the standard of new designs.
3. To train more skilled technicians for the industry.

Overseas Investment

Overseas investment in the local industries generally has a demonstration effect and therefore enhance technological advancement. Since the future of Hong Kong has been settled and more Japanese and European companies are becoming more interested in investing in Hong Kong, the Hong Kong Government Industry Department should launch more campaigns overseas to attract

overseas investments to Hong Kong. Overseas investments in watch and clock production or in the electronic industries will definitely benefit the whole watch and clock industries.

Tackle Labour Shortage and Turnover

Besides co-operating with China to take advantage of their cheap labour, the Hong Kong watch and clock manufacturers should think of ways to train more skilled labours and to retain them. A training scheme should be set up to enrol unskilled workers and put them on an intensive on-the-job training scheme. Better welfare schemes should be introduced to gain their loyalty and reduce turnover. Schemes like medical schemes, provident fund schemes should be set up to encourage a longer service.

Co-ordination of Trade Associations

At present, there are two associations organising and co-ordinating activities for their member watch and clock manufacturers to protect their interests and to promote the industry. They are namely the Hong Kong Watch Manufacturer Association and the Federation of Hong Kong Watch Trades and Industries. Since they are set up for similar purposes, there are common as well as conflicting interests. It is suggested that the committees of these two organisations should gather to propose plans of either to combine or divide areas of responsibilities and interests to avoid duplication of efforts. More efficient use of resources, hopefully, will bring about more constructive programs to promote and to protect the interests of the industry.

CHAPTER VIII

CONCLUSION

From the analysis and performance evaluation in preceding chapters, it can be concluded that the Hong Kong watch and clock industries have been a star performer for the past two decades among other industries. It registered impressive growth rates in domestic exports especially from 1976 to 1980 when the average annual growth rate exceeded 40%! Since 1978, Hong Kong have been able to maintain its position as the world's largest exporter of watches and clocks in quantity terms.

Although the watches and clocks are only the fourth largest industry in Hong Kong after textile/garment, electronics and toys, it was found to be a rather significant sector in the economy of Hong Kong. The watch and clock industries made up of only 3% of the total manufacturing establishments. However, their domestic export value amounted to HK11,323 million, representing 7.4% of Hong Kong's total domestic exports in 1986. This achievement has been increasing through time especially in recent years. Furthermore, with the mere 1,400 establishments, i.e. 3% of total industrial establishments, the watch and clock industries contributed 6.5% of gross output according to recent surveys. They also created over 33,000 employment opportunities representing 3.9% of total manufacturing employment.

The strengths and weaknesses inherent in the Hong Kong watch and clock industries together with the threats and opportunities

the industries are facing are identified and summarised in the preceding chapters.

The Government is found having no overall policy for the industry, let alone the watch and clock industries. Most of the time, it reacts to issues raised from within the watch and clock industries on an ad hoc basis. The supporting departments or institutions are not seen to be working closely together so as to provide effective and efficient services to the watch and clock industries. Hence the watch and clock manufacturers have to organise themselves through the two watch and clock associations for mutual assistance.

Based on the findings, the researchers suggest that the Government should adopt a more positive attitude towards the watch and clock industries to further develop it ahead of the competitors as the nature of the industries themselves suits best the economic environment of Hong Kong. The areas identified that would require Government support and assistance are 1) prevent and resist protectionism 2) encourage and assist design of watch and clock products 3) to financially support R & D of the industries which consist largely of small manufacturing units 4) devise self-owned factory scheme for the industries to increase productivity 5) more training of technicians and designers are called for and 6) encourage overseas investment in related industries in order to benefit the whole watch and clock industries.

APPENDIX 1

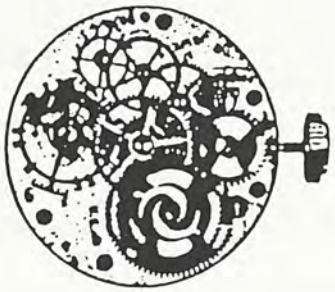
LIST OF WATCH AND CLOCK MANUFACTURERS SELECTED FOR AN INTERVIEW

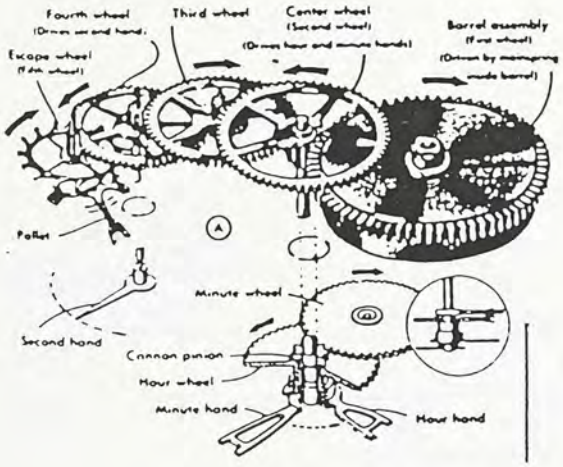
Company	Nature of Business
Alconda Watch Limited	Manufacturer of mechanical and quartz analogue watches
Asia Commercial Co. Ltd.	Manufacturer of mechanical and quartz watches and quartz clocks, etc.
Ballanda Limited	Manufacturer of quartz clocks and watches
Chung Nam Watch Co. Ltd.	Manufacturer of mechanicaal and quartz watches; watch movements, watch modules and metal watch bands
Crystal electronic Enterprises Co. Ltd.	Manufacturer of quartz analog-ue watches
Dailywin Watch Products Manu-facturing Ltd.	Manufacturer of watch cases
Eastern Time Limited	Manufacturer of mechanical and quartz clocks
Easy Watch Products Manufact-uring	Manufacturer of watch cases
Enam Senyawa Trading Co. Ltd.	Manufacturer of watch cases
Fan In Group	Manufacturer of mechanical and quartz watches

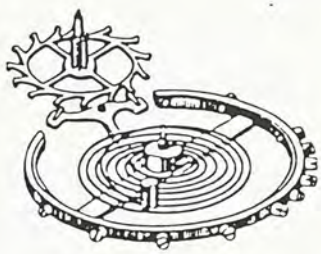
Gordon C. & Co. Ltd.	Manufacturer of quartz watches and supplier of watch movements
Integrated Display Technology Limited	Manufacturer of quartz clocks, electronic stop watches, etc.
Let San Hong	Manufacturer of mechanical and quartz watch movement and complete watches
National electronics & Watch Co. Ltd.	Manufacturer of electronic quartz watches, radio watches, calculator watches and talking watches and clocks, etc.
Perfect Products Co. Ltd.	Manufacturer of watch bands
Prosperity Watch co. Ltd.	Manufacturer of quartz watches
Remex International Time Ltd.	Manufacturer of quartz watches and watch movements
Shing Cheong electronics Ltd.	Manufacturer of quartz watches
Tele-art Limited	Manufacturer of analogue clocks, quartz clocks, quartz watches, etc.
United Watch Dials Mfg.	Manufacturer of watch dials
World-wide Horological Ltd.	Manufacturer of watches and clocks
Yuen Sang hardware Co. Ltd.	Manufacturer of watch bands

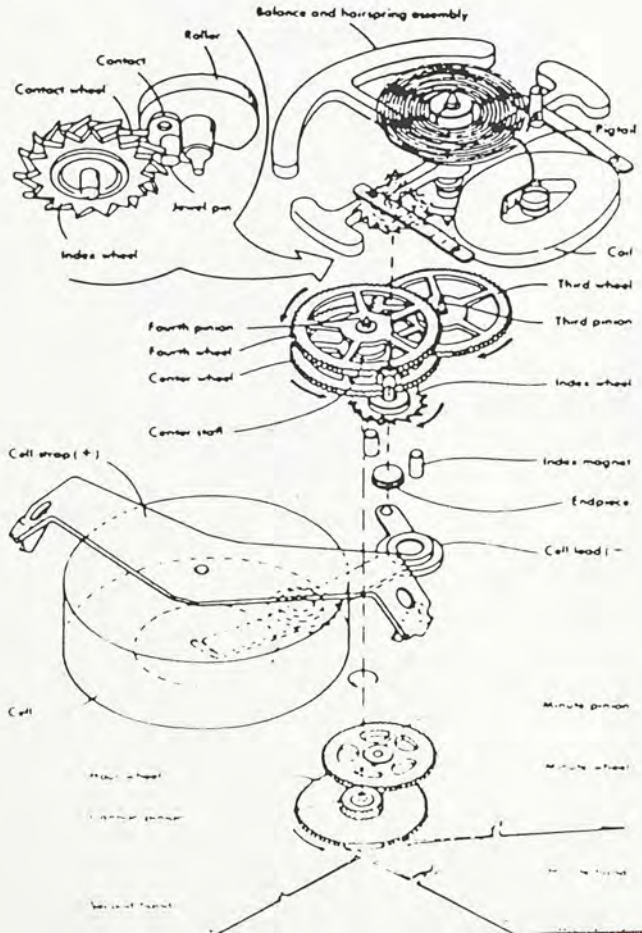
APPENDIX II

ANATOMY OF A MECHANICAL WATCH



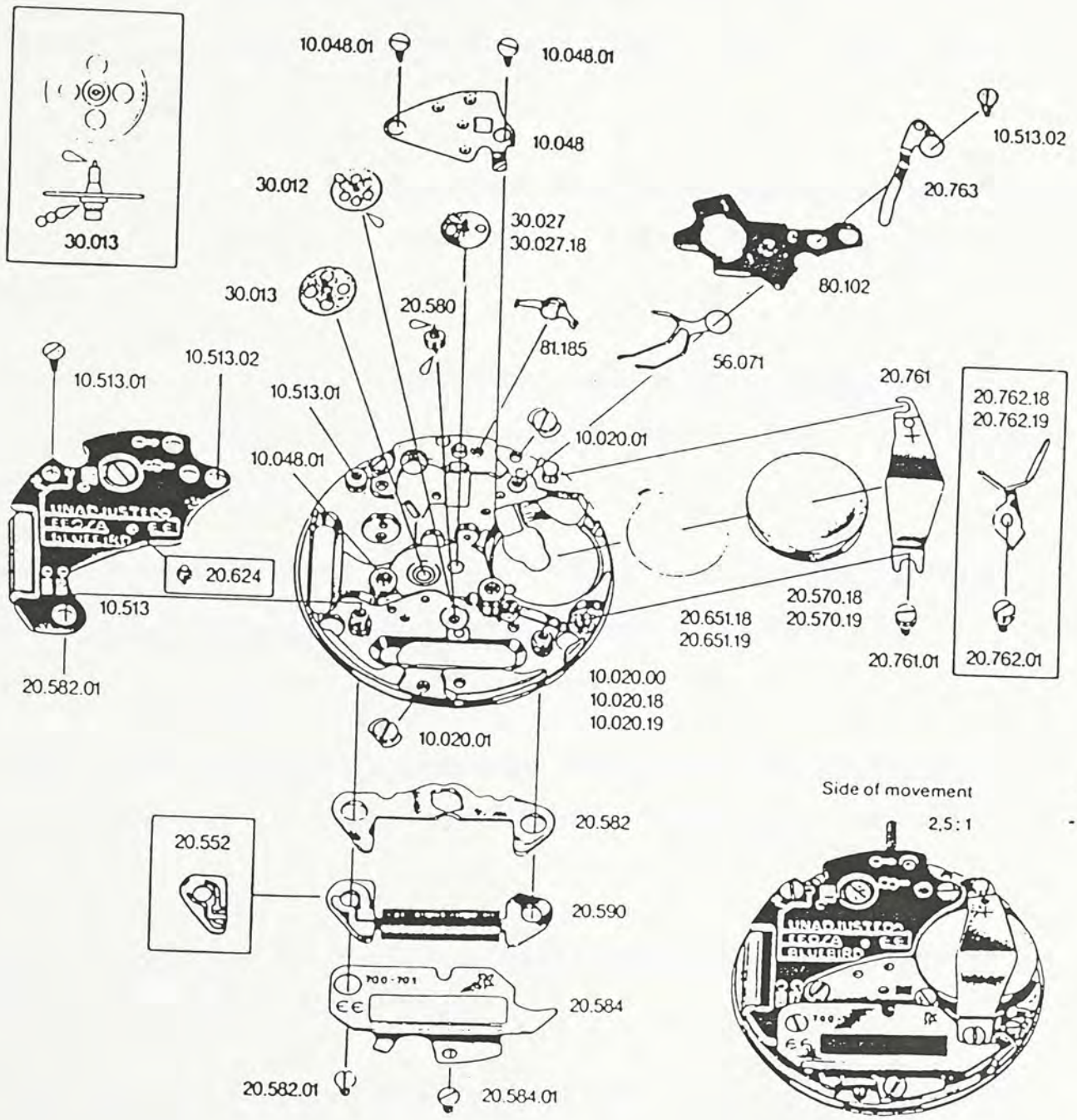






APPENDIX III

ANATOMY OF A QUARTZ ANALOGUE WATCH



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